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**Monitoring
The Crisis
On The
Mississippi**

25 Years Ago In August
A Salute to Radio Prague

Ham Fest Fever
The Rites of Receiver Recycling

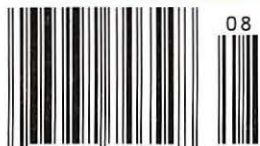
AMARC: *Social Change
Through Community Radio*

One Adventure Too Many

HOLLYWOOD

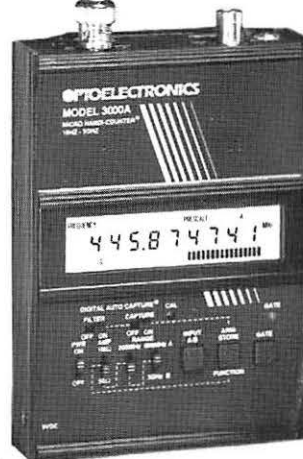
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Monitoring Times

On Location: Monitoring the Movies

By Tom Rugg

10



Tom Rugg

Whether Hollywood comes to your town or you go to Hollywood, seizing the opportunity to see behind the glamour is irresistible. TV shows and movies (such as *Last Action Hero*) are increasingly filmed "on location." Watch for the bright lights, the unmarked vans, the entourage that give them away; then follow this good advice about where to tune, what to expect to hear, and what the jargon means.

Ham Fest Fever!

By Bruce Beeson

14

Beginners, bargain hunters, and vendors looking for a few bucks toward their next coveted purchase are all figures in the ritual of receiver recycling—otherwise known as a hamfest. With a few simple guidelines, you, as buyer or seller, can avoid some costly mistakes.



George Ashleman, KB9ENX

Presstime Special Feature: Monitoring the Crisis on Old Man River

By Larry Van Horn

17

A Salute to Radio Prague

By Don Moore

18

It was 25 years ago in August. The Soviets invaded Czechoslovakia and put an end to Dubcek's "socialism with a human face." But they did not anticipate the courage and ingenuity of Radio Prague staff. Within hours, a network of radio operators was frustrating the invaders and helping boost the self-respect of the Czech people by organizing resistance to the eventual outcome.

COVER: Still a symbol of the movie industry, it's "Hollywood." Photo by Tom Rugg.

AMARC: A Coalition for Community Radio

By Peter Gellert

22

We all know there are groups of people not represented—or misrepresented—in the major newspapers, radio and television broadcasts of every country. The goal of this international organization is to provide a network of support for broadcasters working to change the popular image and the self-image of these populations.

Steve and Elwood's Weird Adventure

By Steve Douglass

25

Most of the excitement in this scanning vacation was supposed to revolve around snatches of military aircraft comms, or maybe even the sight of a stealth aircraft, if one was lucky. But Steve and Elwood discovered the "wild West" still lives!

... And Much More!

If production models of the Grundig Yacht Boy 400—expected to be available in October—measure up to Magne's findings on the preproduction unit, they have a real winner in this portable shortwave receiver!



Is your list of military identifiers as out of date as this B-29 bomber? The Federal File can help you update your files with its compilation of old and new military callsigns.

In these dog days of summer when it's too hot to go outdoors, why not do some research in the air-cooled library? The Beginner's Corner has some tips on unsuspected treasures. Or, you might want fly in an Air Force jet ... from the seat of your computer chair. Turn to Plane Talk for some new sources for flight simulation programs and accessories.

Or turn to any page—It's easy to tune in and let your imagination take flight with *Monitoring Times* by your side!

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LETTERS

What's New in Jersey?

It's the old story with a new twist in New Jersey's latest effort to ban scanners, only this time it seems to have the cooperation of Radio Shack. Bill Sohl, ARRL's regional representative in Northern New Jersey, wrote an excellent letter to NJ's Attorney General DeLuca, enclosing some factual information on cellular telephone and scanner radios. Hopefully this will help to counter the claims being made by Mr. Bozza, Dep. Director of Investigations, Electronic Surveillance Section, that certain Radio Shack scanners have as their primary purpose the reception of cellular frequencies.

Although this contention is patently untrue, Tandy has "voluntarily" had the scanners removed from New Jersey and shipped to stores in other states. Where is the logic in either party's action? Even if the effort to remove scanners were eventually directed against other manufacturers/distributors in New Jersey as well, how can this curtail mail order purchases? Is the state of NJ going to go after the individual owner next? Has Radio Shack (Tandy) established a dangerous precedent, or have they seen the writing on the wall and are grabbing sales where and when they can?

We applaud those hobbyists in New Jersey who are doing all they can to halt this disturbing trend before it spreads any further. Keep a watchful eye on your state officials.

The Melee That Was Yugoslavia

Bob Vunovich's admission that he "could not have approached the clarity or brevity of the piece provided by the Van Horn's" is preceded by three pages of why the situation in the former Yugoslavia is anything but simple. Vunovich, of Clarksburg, MD, recounts enough examples of inaccuracies in the way we remember the region's history as well as how it is reported by the media, that "I was convinced I needed to spend more time listening to shortwave, and less to the U.S. press and television... I'm no longer sure that what I see and read hasn't been altered by the public relation spin doctors [hired by the Muslims and Croats]. I'm convinced there is plenty of blame for all three sides." Vunovich convincingly documents a great deal more suffering by the Serbian people than the U.S. press currently credits them.

It's significant, I think, that in looking for a "bottom line" to quote from Bob's letter, there is none; it is symbolic of the entire situation. If any of our readers would like the full text of Vunovich's historical overview, please send an SASE addressed to "Letters," and I will be happy to send you a copy.

Don Moore, our historian from Davenport, IA, also complimented Larry and Gayle on a nice job covering a very volatile area. "But I was surprised that there was no mention of Kosovo, the southern portion of Serbia and the ancestral homeland of the Serbs. As such, it holds a lot of symbolic importance to the Serbs. The population of Kosovo, however, is around 90% Albanian, and they exist under a strong state of repression by the minority Serbs.

"The Albanians desire either an independent state or a union with Albania. Should they try either—which is very likely—the resulting war could be as bloody as that in Bosnia, and Albania will surely enter the fray to help their fellow Albanians in Kosovo."

Working the Russian Robots

"I thank Ike Kerschner," says Theodore Walker, Jr., of Dallas, TX, "for showing in his May column that popular assumptions about the elite intellect and costly hardware required for amateur satellite communications are wrong."

"As Ike says, 'anyone with a Tech plus ticket has the gear' required to access the Russian Radio Sputniks. One can work a RS robot in mode K with almost any moderately powered HF transceiver programmed for split CW operation. Here's how:

"The last time I heard an RS robot call CQ, it was RS-12 on 29.454 MHz. Answer the robot on 21.130 MHz. The robot's ten meter downlink signal is strong enough to come through on the fifteen meter uplink antenna, so there is no need for a second antenna.

"I worked the RS-12 robot with a Kenwood TS-140S running 40 watts of CW into a base-loaded vertical antenna angled out from an inner-city second floor apartment balcony. The QSO went like this: Listening on 29.454 MHz, I heard the robot call, 'CQ CQ de RS12 QSU 21130 kHz AR.' (Please note that the robot told me to answer on 21.130 MHz; at other times it may stipulate uplinking on a different frequency.) I answered 'RS12 de WB4MFI AR' (AR must be sent as a single character). The robot responded 'WB4MFI de RS12 QSL NR 0574 OP ROBOT TU SW QSO NR 0574 73 SK.' That's all there is to it.

"Given an HF transceiver programmed for split CW operation, a modest fifteen meter antenna, an electronic keyer (because the robot does not copy less than perfect CW), and a fisherman's patience and luck (the robots are not always biting), space age communication is available to almost any radio amateur."

Inspired to Create

We were delighted that Ray Autrey, author of April's "Broomstick Loop Antenna," shared

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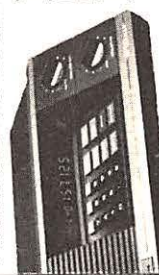
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LETTERS

a letter to him from Richard Hankison of Prairie Village, KS. Richard caught the intent of the article perfectly—to encourage others to experiment. Here's his story:

"I created your Broomstick Loop Antenna. It worked well. Granted it was no match for my DX Sloper mounted 20 feet off the ground, but it did work as well as the portable, random wire I use with my Sony ICF-2010 when I travel. Less space than the random wire, too. I get embarrassed when the maid at the Holiday Inn trips over my antenna and falls in the bath. But, alas, your broomstick loop was ugly. As hard as I tried, I could not make the lengths of cable lie exactly parallel to each other. The lack of symmetry drove me wild.

"Crazed but undaunted, I hit upon the solution. Rather than using 5-foot lengths of 4-lead telephone cable, I decided to experiment by taking one length of cable 25 feet long. And instead of trying to lay them parallel along the length of the broomstick, I decided to wrap the 25-foot length around the broomstick. Voila! The antenna created was about as good as your antenna, and there were only five connections to make. Instead of having a 100 foot antenna that measured 4 feet in length, I had a 100 foot antenna that was only about 2 feet long—the maid won't trip on that! (But the antenna looks like it will double as a billy-club if she makes any unwanted advances.)

"Now I have a really nice, portable antenna that should easily fit into my carry-on luggage. (Then again, it will probably raise a few eyebrows with airport security—perhaps I should pack my antenna in my checked baggage.) I hope you enjoyed my improvisation; thanks for providing the basic concept."

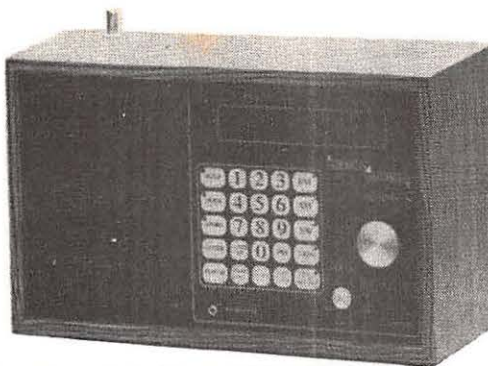
That's the whole philosophy of *Monitoring Times* in a nutshell—it provides a jumping-off place to enjoy your own adventures!

Receiver Feedback

• "Thank you, *Monitoring Times*," says Paul Estes of Kewanee, IL, "for helping me come to the conclusion that my ears weren't lying." Paul was following with interest the saga of the Superadio III, which confirmed his suspicions that it wasn't up to par with the Superadio II. Then came the report that there was a flaw in earlier models which could be corrected.

Paul called the GE 800 Answer Line, and was told the manufacturer, Thomson Electronics, would repair it. He called Thomson's Consumer Relations department in Indianapolis, IN, and was told to send the unit to the Thompson Exchange Center in El Paso, TX (32 Spur Drive, zip 79906). Paul thought others with a defective model III would like to know the procedure.

• Tom Sundstrom of Vincentown, NJ, wrote regarding a statement by Larry Magne that no



review of the Yaesu FRG-100 would be done until "the real thing...comes off the production line." Sundstrom reminds us that "New receivers are not necessarily released first in North America. ...The first production models of the FRG-100 arrived in Europe in November 1992," even though in NA, first production units did not start arriving until mid-January.

• George Van Houten of Daytona Beach, FL, "is very disappointed that a (mostly) American made shortwave radio, the Electrola DX-100, *out about a year now* [italics mine--ed], still hasn't been mentioned or reviewed in your specialized shortwave magazine. This radio, for the price range and if it's a good quality product, could be an alternative to your foreign models that you review all the time, for those of us who want to buy American."

Larry Magne has been following the mixed fortunes of this radio, which is known under two names, in the pages of *MT*. He gives his analysis of the first production model in this issue; the updated unit arrived at presstime.

Re-Radiation Theory

Patrick Besant-Matthews of Dallas, Texas, is full of ideas for articles he would like to see. For instance, he wonders how to prevent electrical equipment from leaking "radiation": "When I was growing up in England, the Post Office regularly sent vans around the streets to listen for unlicensed radio TV receivers. I believe they continue to do so and that it is commonplace in countries where receivers require an annual license fee. I believe detection is based on reradiation."

Patrick suggests an article that would cover some of the following points: how radiation is generated and where, its directionality and field strength after leaving the source, and how it can be reduced or rendered undetectable.

Here's another article idea: "I hear that it is possible to 'read' computer activity from outside a building with suitable equipment. How can you shield your home or business to ensure privacy?"

Patrick is also coming up with all kinds of seemingly unanswerable questions as he is building his own home. "For instance, will wires in conduits give less background and 60 Hz field strength than Romex cables, and if so, how much less?" In other words—if one were designing the ideal house for a radio hobbyist, how would it differ from standard house construction?

If you feel you could address these or similar questions in understandable terms, the Editor would like to hear from you!

Short Shorts

"The UFO net on 3978 Saturday evenings, mentioned by Rex Whetzel in June 'Letters,' is called the 'UFO Discussion Net.' On the occasions that I have monitored it, the net control would always say that 'it is not a part of MUFON although the net is recognized in MUFON literature.' I would assume, however, that many MUFON members do check into this net and that may explain why the 3929 net appears to be inactive.

"As for the Intergalactic Informational Exchange Net, the 1993-94 *ARRL Net Directory* says that it is on Fridays at 0000 on 3930. Since the *Directory* does not mention which nets move one hour earlier during DST (most do), he might start checking 3930 Thursday (or Friday, in case the day given is local NAM and not UTC) starting at 2300. Net manager is KA1DYG."

John Norfolk, Oklahoma City, OK

"I set up my radios on five different occasions at a church that does special tutoring for underprivileged children. I was a big hit each time. They would tell me what country they wanted to hear, and I did my best to get it. We would listen to about 15 countries each trip. Their teacher would find it on the map and tell them about the country. We also listened to hams one night. They loved listening this way. It was different because they had never heard of shortwave before. I know there are a lot of schools that have radio stations and probably use shortwave for teaching."

James Tobola, West, TX

Any school using radio in the classroom is eligible for a complimentary subscription to *Monitoring Times*. All you have to do is to write (on school letterhead, if possible) a brief description of how you are using radio, and mail it to the Editor.

"As President of the Garland Amateur Radio Club, I wish to thank you for your shipment of *MT* for our elementary school classroom project.

"On a separate matter: because of the economy, I'd like to see some kind of job opportunity listings each month from the numerous entities that we monitor. Besides, I need a job myself."

Swank Roberts, Garland, TX

Several of our well-qualified readers have found themselves unexpectedly job-hunting over the past couple of years, I know. I see no practical way for *Monitoring Times* to be of service in any significant way; however, we would be happy to post free of charge any radio/electronics job openings or short employment wanted notices

Continued on p. 111

**If you're into radio
monitoring...
DON'T MISS THIS!**



SCHEDULE

Friday, October 15

- 11:00 am to 5:00 pm
Registration Open
- 12:00 to 5:00 pm
Exhibits and Listening Post Open
- 7:00 to 9:15 pm
"Hobby Talk"

Saturday, October 16

- 8:00 to 11:30 am
Registration Open
- 9:00 am to 12:30 pm
Exhibits Open and Morning Seminars
- 12:30 to 3:00 pm
Exhibits Open/Lunch Break

Saturday cont'd

- 3:00 pm
Exhibits Close
- 3:00 to 5:15 pm
Afternoon Seminars
- 7:00 to 9:00 pm
Banquet—Served at table
- 9:00 pm
Transmitter Bug Hunt

Sunday, October 17

- 9:00 am to 12:30 pm
Morning Seminars
- Convention Closes at 1:00 pm

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- A two hour hobby talk starts the weekend off Friday evening and is hosted by moderator Bob Grove. A panel of experts will discuss the current developments in the hobby.
- Attend any of over 35 seminars covering shortwave and scanner monitoring for the beginner through the advanced listener.
- Saturday evening's banquet will feature guest speaker Carole J. Perry, noted author, teacher and promoter of amateur radio.
- Get your scanner charged and ready for the "Bug Hunt"—a highlight at each convention!
- A swap meet area available Sunday for those attendees with equipment to sell or trade.
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C'mon, Join the Club!

The National Association of Broadcasters has made available a free brochure called, "Radio Station Ownership: Four Steps to Making a Station Yours."

While the title promises to walk you through such heavy-duty topics as "legal and technical requirements for radio station acquisition" and "contracts and FCC forms," it fails to provide help on the one topic that'll slow down your dream of owning a radio station faster than anything else: where to get the money to buy one. Hot properties can fetch hundreds of millions of dollars.

But don't despair. We can still dream. Get your copy of the booklet by calling 202-429-5350 or by writing the NAB at 1771 N. Street, N.W., Washington, DC 20036-2891.

...But Play By Our Rules

The National Association of Broadcasters has asked the Federal Communications Commission to reject a waiver request by Satellite CD Radio, Inc. to build a new satellite transmission facility.

Satellite CD Radio plans to broadcast CD quality audio to listeners directly from satellite. The NAB doesn't like that because the waiver would give satellite proponents "a competitive head-start over the nation's 11,000 radio stations."

Given the "harsh economic stakes for broadcasters," the NAB is hoping to tie up the idea in the Commission. Better wait before you buy that station...

ARRL Insurance Program Broke?

The computer bulletin boards are alive with reports that the American Radio Relay League's Insurance Program has gone broke. According to reports, the ARRL policy was revoked for non-payment of premiums. Says one notice, "Policyholders may request a refund through the ARRL in Newington. Funds approximating 50 cents on the dollar are available..."

One ham even reported on-line that he "...received a refund on my premium last Wednesday." The problem is that the whole story was a hoax.

Amateur Bird Wounded

It got off the ground OK but little went right from there. Launch officials had difficulty contacting the ARSENE (UO-22) ama-

teur radio satellite. Then the downlink frequency of 145.975 was silent. Even the 2446.47 MHz signals were weak.

Officials are still working on the bird and hope to have its 435.100 uplink (2446.500 MHz downlink) operational for packet radio traffic.

Losing Your Radio Rights?

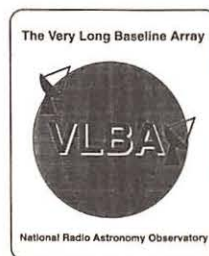
It seems that we're receiving more and more news of radio operators who are forced to remove their antennas, take down towers and even stop transmitting, by neighbors organized into so-called "Homeowner's Associations."

Last month, the U.S. Senate took testimony on the activity and abuses of homeowners associations. Senator John Glenn says that he's interested in learning how they infringe on individual rights. We regret that we did not receive this information in time to allow *Monitoring Times* readers to participate in the hearings.

New AMers to Take to the Air

The new expanded (1605 to 1705 kHz) AM band has opened up ten new channels. According to the FCC, the new frequencies will be first offered to daytime-only stations in cities of more than 100,000 that have no full-time FM or AM station.

An example of how this all can be used by the enterprising station owner to turn a sow's ear into a silk purse is WJDM. WJDM is a 1 kilowatt daytime-only station which covers about 2 million people in Elizabeth, New Jersey. Because of the preference policy, it is likely that WJDM will get one of the new frequencies. If it does, the station will automatically become a 10,000 watt station with coverage of some 17 million people, including New York. Nice deal.



A System of Superlatives

That's what the National Radio Astronomy Observatory is calling its Very Long Baseline Array, which is being dedicated in a ceremony in Socorro, NM, this month. The VLBA uses ultra-sensitive radio receivers, superfast tape recorders, atomic clocks, and a high performance computer to create a vision so sharp it could read a newspaper in New York from the distance of Los Angeles.

The VLBA is comprised of ten receiving stations spread over 5,000 miles of U.S. territory. Its purpose is not only to study celestial bodies and the age and size of the universe, but also to

research global climate change, earthquakes, and spacecraft navigation.

Turning the Tables, Big Guy

Uniden, the world's largest manufacturer of scanners, only recently ended a prolonged legal battle with rival scanner maker AOR. So even the scanner giant seemed to be taken aback a little when it was announced that it was being sued by a Canadian firm called B.E.L.-Tronics — for patent infringement.

Paul Davis, Executive Vice President of Uniden America corporation, said that the company was surprised by the filing. "When first made aware of BEL's allegations, Uniden offered to have its patent attorneys meet with BEL's patent attorneys to discuss the merits of the claims in full detail. Uniden [even] offered to demonstrate why BEL's claims lack merit. Inexplicably, BEL chose not to accept this offer."

Says Uniden attorney Gary Klein, "Uniden plans to vigorously defend itself against this action and expects a favorable conclusion."

Say That Again, Comrade?

Former soviet president Mikhail Gorbachev, at a gathering celebrating the 50th anniversary of Radio Liberty, called on the Clinton administration to continue funding the broadcasts, which transmits news and information into the nations of the former Soviet Union. Gorbachev himself was responsible for jamming Radio Liberty broadcasts until December of 1988. The station, which signed on in 1953, was originally funded by the U.S. CIA.

After months of debate, Clinton has agreed to a compromise in which Radio Free Europe-Radio Liberty and the VOA will all be administered by an independent board of governors under the auspices of the US Information Agency. The new board will also continue work on setting up Asian Democracy Radio.

North Korea Disagrees

Unlike Mr. Gorbachev, Stalinist North Korea apparently does not see the benefits of having the United States broadcast into its territory. North Korea recently denounced plans for the Radio Liberty-like Radio Free Asia as an "imperialist and undisguised provocation against sovereign state and an aggressive interference."

In case you've forgotten what the old Cold War rhetoric used to sound like, here is part of the text of the North Korean statement:

COMMUNICATIONS

Birminghamfest 1993 — Bittersweet Memories

The warmth and charm that we know as "southern hospitality" was once again prominent at this year's Birminghamfest. Several thousand visitors wandered through the indoor flea market, meeting old friends and sweeping up bargains from the swap tables.

This year, *MT* publisher Bob Grove was the featured banquet speaker, delivering an animated and memorable talk as he recalled the humorous and nostalgic days of growing up with radio.

Bob was caught off guard when he was presented an appreciation award—an antique Radiola III tube radio just like one he



Bob Grove receives a very special award, an antique Radiola III receiver, restored and donated by Don Kresge.



had as a youth and regretted trading many decades ago. He admitted it was an emotional moment for him.

Donald H. Kresge, 1911-1993

The gift, restored and donated for the occasion by Donald H. Kresge, took on very special meaning; a week later, Don passed away, leaving a legacy of technical creativity and enlightenment.

Don was instrumental, along with Major Edwin Armstrong, in the development of FM radio; he also helped develop the LORAN navigational system during the second world war and, more recently, co-founded the Alabama Historical Radio Society.

Don Kresge was an authentic radio pioneer and will be sorely missed by his many friends and colleagues.

"While threatening (us) by wielding the nuclear stick, the United States is foolishly attempting to destroy the socialist system of Korea by raising the wind of liberalization with black propaganda full of lies and deception..." etc., etc.

SOS! SOS! My Parents Are Irresponsible!

A young boy who used the radio to frantically report "SOS, SOS. We need help" sent a 140 foot Coast Guard cutter, two Coast Guard helicopters and a patrol boat on a search east of Chambers Island and west of Door County near Sister Bay, Wisconsin.

The search was underway for over three hours when a boater at a nearby marina spotted an 11 year-old boy running around the docks with a hand held radio. When confronted, the boy's parents admitted that they knew he was "playing pirate" with the radio.

What they didn't know was that they would receive a citation. The taxpayers, however, picked up the \$20,000 bill for the search.

Fatal Antenna Mishap

When a 25-foot antenna touches a 13,000 volt power line, the results are as predictable as they are preventable. In this instance, two men from Onondaga, New York, were killed: Kevin Scanlon, owner of the CB antenna being erected, and Edward Fellows, a friend who had stopped to borrow the phone.

Rescue workers were unable to retrieve the bodies for 25 minutes until the power, which had melted the antenna and set several pine trees on fire, was disconnected.

Niagara Mohawk Power Corporation spokesman Jim Cosgrove said accidents are common during summer months and urged people to check out nearby lines before working outdoors.

Communications is written by Larry Miller from a variety of sources including material sent in by the following readers and other VIPs: Dave Alpert, New York, NY; Rachel Baughn, Murphy, NC; Steve Berk, Houston, TX; Ken Hydeman, Xenia, OH; Ken Mason, Washington, DC; Clem Small, Montana; plus the *W5YI Report*.

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Unlike other longwire and sloper antennas you can use coax for clearer low noise reception with no signal loss: The Magnetic Balun matches the antenna to your coax. Can be installed as a horizontal longwire or as a sloper.

Model WB-1 \$59.95 + \$4 shipping/handling U.S. & Canada. California residents add sales tax.



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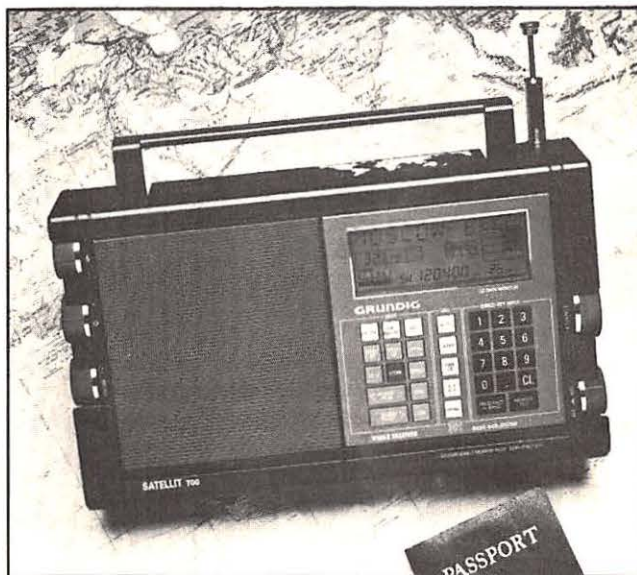
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Continuous shortwave tuning from 1.6 to 30 megahertz covers all shortwave bands, plus FM-stereo, AM and LW. Single sideband (SSB) circuitry allows for reception of two-way amateur, military and commercial communications, including maritime and aeronautical. 120 factory pre-programmed frequencies for world-wide reception. Dual conversion superheterodyne receiver design.

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Frequency Coverage	Default Steps
25.000 - 25.995 MHz (AM)	5.0 KHz
26.000 - 28.995 MHz (AM)	5.0 KHz
29.000 - 53.995 MHz (NFM)	5.0 KHz
54.000 - 71.995 MHz (WFM)	50.0 KHz
72.000 - 75.995 MHz (NFM)	5.0 KHz
76.000 - 107.995 MHz (WFM)	50.0 KHz
108.000 - 136.995 MHz (AM)	12.5 KHz
137.000 - 173.995 MHz (NFM)	50.0 KHz
174.000 - 215.995 MHz (WFM)	50.0 KHz
216.000 - 224.995 MHz (NFM)	5.0 KHz
225.000 - 399.995 MHz (AM)	12.5 KHz
400.000 - 511.995 MHz (NFM)	12.5 KHz
512.000 - 549.995 MHz (WFM)	50.0 KHz
760.000 - 823.995 MHz (NFM)	12.5 KHz
849.0125 - 868.995 MHz (NFM)	12.5 KHz
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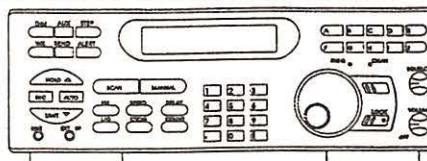
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Frequency Coverage	Steps
29.000 - 54.0000 MHz (NFM)	5.0/12.5/25.0 KHz
108.000 - 136.9950 MHz (AM)	5.0/12.5/25.0 KHz
137.000 - 174.0000 MHz (NFM)	5.0/12.5/25.0 KHz
216.000 - 224.9875 MHz (NFM)	12.5/25.0 KHz
225.000 - 399.9875 MHz (AM)	12.5/25.0 KHz
400.000 - 512.0000 MHz (NFM)	12.5/25.0 KHz
806.000 - 823.9875 MHz (NFM)	12.5/25.0 KHz
849.0125 - 868.9875 MHz (NFM)	12.5/25.0 KHz
894.0125 - 956.0000 MHz (NFM)	12.5/25.0 KHz

The Bearcat 890XLT gives you pure scanning satisfaction with amazing features like Turbo Scan. This lightning-fast technology enables the Bearcat 890XLT to scan and search up to 100 channels per second. Because the frequency coverage is so large, a very fast scanning system is essential to keep up with the action. That's why Uniden's latest technology, Turbo Scan is built into our new Bearcat scanners. Other features include VFO Control - (Variable Frequency Oscillator) which allows you to adjust the large rotary tuner to select the desired frequency or channel. Weather Alert - Lets your scanner function as a severe weather warning radio. Auto Store - Automatically stores all active frequencies within the specified bank(s). Auto Recording - This feature lets you record channel activity from the scanner onto a tape recorder. You can even get an optional CTCSS Tone Board (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. 10 Banks - Each bank contains 20 channels, useful for storing similar frequencies in order to maintain faster scanning cycles. For maximum scanning enjoyment, order the following optional accessories: PS001 Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter \$14.95; PS002 DC power cord - enables permanent operation from your vehicle's fuse box \$14.95; MB001 Mobile mounting bracket \$14.95; BC002 CTCSS Tone Board \$54.95. The BC890XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited warranty from Uniden. Order today.



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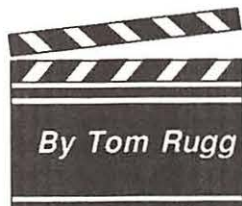
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On Location: Monitoring Movie and TV Crews



Have you ever seen a movie or TV crew filming in your town? Your scanner is your ticket to find out what they are doing. And if you visit Los Angeles, as millions do, be sure to bring your scanner. A few tricks are all you need to monitor the activities of movie and TV crews.

In the Los Angeles area, these crews are constantly on the streets filming movies, TV shows, commercials, and instructional videos. Small, portable filming and lighting equipment, along with high construction costs, often make it more economical for them to pack up and go film at, say, a restaurant or a residential neighborhood than to build an artificial one on a movie lot. This was not the case back in the 1930's and 40's, when equipment was bulky and labor was cheap, making it more economical to construct fake buildings and streets on the movie lots.

Local L.A. residents often see clusters of trucks, movie lights, and technicians on the city streets. We've learned to take a quick look as we drive by and not think much more about it. If we stopped and investigated every one, we'd miss dinnertime too often. Besides, the crews use security officers to prevent onlookers from getting too close and the stars generally stay out of sight.

Movie and TV crews don't restrict themselves to Southern California, of course. Big cities such as New York, Chicago, and San Francisco are frequent backdrops for films and TV shows. And big cities aren't the only locations favored by these crews. Movie companies in particular often set up shop in or near a small town anywhere in the U.S. (or the world) for weeks at a time to make films. Any time filming takes place away from the company's home facilities, the crew is "on location," even though it may be only a block away.

However, no matter if a crew films in your home town, security officers are hired to keep the public from getting too close. Too bad, because everyone is interested in movies and TV. But you have something the rest of the public doesn't: your scanner gives you a way to be part of the action.

What You Can Hear

Two types of movie activity are commonly broadcast over the radio: handheld radio messages between various crew members (technicians, directors, location managers, etc.), and the actual film soundtracks recorded using wireless microphones. You can hear both if you get close enough.

Although some handheld radio messages use repeaters and can be heard for miles, most messages are broadcast only locally at low power and



Hollywood is home to most of the big studios, but Burbank and Culver City also yield good scanning action.



you have to be within a mile or less to pick them up. Wireless mikes in particular are often hard to hear beyond a few hundred yards. In either case, however, a good antenna and a sensitive radio can greatly extend these distances.

In late 1992 and early 1993, Arnold Schwarzenegger's latest big-budget movie was shooting in several locations around Los Angeles. It's called *The Last Action Hero*, just released this summer from Columbia Pictures. Some detective work and frequency monitoring led to the following discoveries.

Most communication between crew members took place using handheld radios on four frequencies: 173.375, 173.275, 173.325, and 175.225 MHz. The crew called these frequencies One, Two, Four, and Six, respectively. Frequency One was the main channel for important, brief messages, such as trying to track down an actor or crew member, or telling everyone to be quiet because they were about to shoot a scene. When anyone wanted to hold a longer conversation, they agreed on channel One to "Go to Two" and talked there. Two was also used for traffic control to prevent vehicles from driving up to the filming location at the wrong time and spoiling a shot.

Frequencies Four and Six were used mostly for communication between members of specialized work units: construction crew members who did carpentry and electrical work for upcoming scenes, electricians who set up lights for complex shots, and transportation people who kept track of shuttle vehicles and trucks. Other movie companies use these same frequencies, but there seems to be no standard for which one is the main channel.

Radio Frequencies Used by Movie and TV Crews

All freqs MHz

Handheld Radios

152.87, 152.9, 152.93, 152.96, 152.99,
153.02, 173.225, 173.275, 173.325,
175.375

Wireless Mikes

169.445, 169.505, 170.245, 170.305,
171.045, 171.105, 171.845, 171.905
72-76 MHz and 174-216 MHz.

Movie and TV crews also use 152.87, 152.9, 152.93, 152.96, 152.99, and 153.02 MHz. For *The Last Action Hero*, several of these other frequencies (especially 152.9) were used by the second unit, which is the name for a part of the film crew that films scenes separately from the main first unit. (The first unit works with the actors; the second unit concentrates on stunts and other scenes where doubles fill in for the actors.) All these same frequencies are also used in Los Angeles on the movie lots to control traffic and communicate between technicians.

Small, low-budget film crews in remote areas might even use the toy walkie-talkie frequencies. Check 49.83, 49.845, 49.86, 49.875, and 49.89 MHz if you see a small film crew and you can't find any communication on all the other frequencies.

Any of the typical wireless mike frequencies might be used to broadcast sound from the micro-



When you go out looking for a movie or TV crew, don't expect their trucks to be labeled in big letters with the name of the movie studio, TV show, or production company.

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phones to the sound recording equipment. Arnold's crew sometimes used 72.9 MHz (which is unfortunately not receivable on many low-cost scanner models) and 170.305 (which is). Use your scanner to look in unused gaps in the 72-76 MHz range and the 174-216 MHz range, if you can receive these frequencies. Also try the standard wireless mike frequencies: 169.445, 169.505, 170.245, 170.305, 171.045, 171.105, 171.845, and 171.905 MHz.

Wireless mikes make the most interesting listening because they allow you to hear what the director and the actors are saying on the set. Arnold was easily recognizable reading his lines, along with the sounds of gunshots, footsteps, and breaking glass, as you'd expect in an action movie. After a shot, the director and other crew members discussed the shot and set up another "take" to try again. Usually each shot is only a few seconds long and some of them require dozens of takes before the director is happy with the result. For TV shows, less time and money are available, so fewer takes are filmed.

Unfortunately, not all sound is recorded using wireless mikes. When a film crew uses wired mikes instead of wireless, you can't pick up the sound. But you can still monitor a lot of the crew's actions if you listen to the handheld radio frequencies.

When you go out looking for a movie or TV crew, don't expect their trucks to be labeled in big letters with the name of the movie studio, TV show, or production company. At most, their vehicles are marked with very small lettering. Some of Columbia's vehicles had a small sign saying "Sony," which is Columbia's parent company. The big trucks were plain-looking and unlabelled. The movie and TV people learned long ago that well-marked trucks attract extra crowds that only get in the way.

"Your scanner can pick up plenty of action if you get close to a movie or TV lot..."

Look for several unmarked trucks—usually the type with beds 12 to 28 feet long—plus a couple of RV's for the stars to relax and dress in, and maybe a catering truck. Big-budget movies may use over two dozen vehicles. Low-budget movies and TV shows use fewer. When filming takes place at night the lights are the obvious tip-off. The action always happens in front of the lights. Even during the day, fill-in lights and reflectors give away a film crew's identity, and show you where the next shot will be.

Lock it up!	Lock the door to the set. Stop traffic. We're about to start filming a scene.
Rolling!	The camera is rolling and getting up to operating speed. Film is being shot.
Action!	The actors should begin acting out the scene.
Cut!	Stop filming; the scene is over.
Print it!	The filmed scene went well; make a note to print that part of the film. (If the scene didn't go well, they don't waste money making a print of that portion of the film negative.)
First unit	The main film crew, working with the actors.
Second unit	A second crew using doubles and working separately on the same movie. (Sometimes both units work together.)
First team	The actors.
Second team	Stand-ins who take the place of the actors during lighting and planning for the shot.
Honeywagon	Portable rest rooms.
10-100	In the rest room. ("He's 10-100 right now.")
The set	The place where filming takes place.
A.D.	Assistant Director. The one who, along with the Production Supervisor, gives most of the orders and does most of the shouting on the main handheld frequencies. Movies usually have a 2nd A.D. and even a 3rd A.D.
P.A.	Production Assistant. A do-anything "go-fer."
Key grip	The head technician who sets up camera tracks and/or scenery.
Gaffer	The head lighting technician. Others are electricians.
Best boy	Gaffer's assistant and administrator.
Craft service	A laborer who performs miscellaneous clean-up chores for technicians.
Base camp	The place where most trucks are parked if they can't be parked right next to the set. Some crews use vans to shuttle people between base camp and the set.
Photo double	A person who resembles an actor and fills in during distant shots.
Stunt double	A person who fills in for an actor during dangerous or difficult stunts.
2K, 4K, 6K, 10K	2000, 4000, 6000, and 10,000 watt lights.
Brute	A 300-amp arc light.
Wrap	Completion of work for the day. Put things away and go home. ("That's a wrap!")

Movie Jargon

Like any other occupational specialty, the movie business has a language all its own. Table 1 lists some terms you may hear when you monitor movie and TV frequencies.

Where To Look in L.A.

If you visit Los Angeles, you can find most of the main movie and TV companies in Hollywood (naturally), Burbank, Culver City, and West Los Angeles. Your scanner can pick up plenty of action if you get close to a movie or TV lot in one of these areas. Burbank is a real gold mine because Disney, Warner Brothers, and NBC are all within a few blocks of each other; MCA/Universal is only a mile away in Universal City, and another mile or two away in Studio City is CBS Studio Center. Hollywood has more studios, but they are spread farther apart. The big ones are Paramount (which includes the old RKO studio), ABC, CBS Television Center, and the Warner Hollywood Studios. Culver City has Sony/Columbia Pictures (the old MGM studio) and The Culver Studios. Twentieth Century Fox is in West L.A.

Crews often work at night and on Saturdays as well as during normal business hours. The TV shows that are "filmed before a live audience" are shot at many of these studios, usually on Tuesdays and Fridays during the late afternoon and evening. Some of the handheld radio frequencies listed here are used to coordinate audience seating in addition to normal crew communication.

Keep in mind that a lot of location filming for both movies and TV shows is done close to the studios, to reduce travel time. So if you are near a studio and hear a crew on your scanner, you won't immediately know if they are in the studio or nearby on location. Sometimes you'll even hear more than one crew using the same frequency, especially if you use a better antenna than the crews do and you're in Burbank or Hollywood. Another source of occasional confusion is that some of these frequencies are shared by local businesses. Don't be surprised to hear someone paged to call a telephone extension.

Now you know the frequencies, the language, and the locations. Look for some film crews or hang around a studio and soon you'll know more about movies and TV than most Hollywood insiders. Well, some Hollywood insiders, anyway.

And for this article, that's a wrap.

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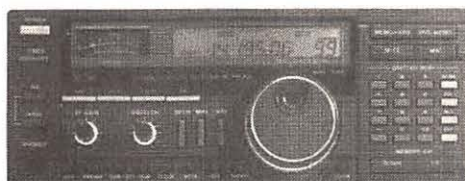
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HAM FEST FEVER!



The Bargains And The Fun Are Contagious!

By Bruce Beeson, KA9APQ

On a recent Sunday morning, the alarm clock blatantly shattered the solitude of my dreams at 5 A.M. It was still dark outside, but I didn't need to look out the window to know what the weather was like. I could hear the rain dancing on the roof, and my official "weather-forecasting knee" told the rest of the story. It was a typical early spring day in Chicago; damp, chilly and windy. No time to dally; there was just enough time for "Breakfast In A Bag" shoved through a drive-up window. As I merged onto the Tri-State

Tollway and headed north, I turned on the mobile scanner in search mode between 144-148 MHz. Almost simultaneously, the rain began to diminish and the skies began to brighten. "Yep," I said to myself, "This is going to be a great day for a Ham Fest!"

If you've never been to a Ham Fest, you're missing a lot, so hang on for a whirlwind tour. And even if you are a "Veteran Hamster," come and tag along for the ride.

The first important rule to understand is this: Despite its name, a Ham Fest is definitely not just for hams! Anyone interested in shortwave, scanners, computers and electronic gadgets of all types, can benefit from attending one of these events. Whether you're a seasoned fanatic looking to upgrade your already substantial "freq show," or the beginner looking to purchase your first receiver on a pauper's budget, you've come to the right place.

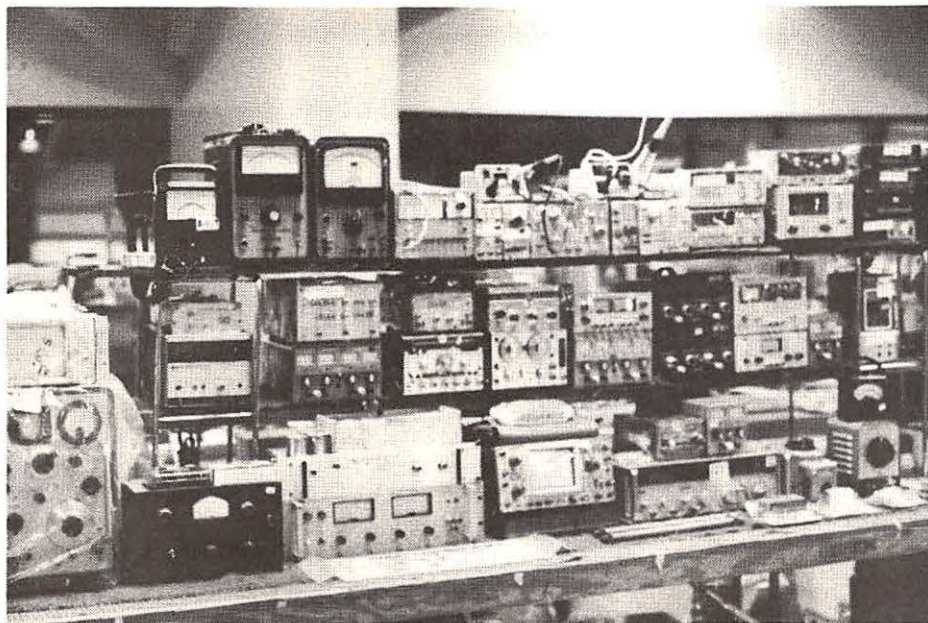
You've Come A Long Way, Baby!

Basically, a Ham Fest is an electronic flea market. Its very early beginnings catered mainly to hams and "wanna bees" in search of war surplus equipment and "home-brew" rigs. Today's fest can range from a simple "tailgate" affair in a school parking lot, to an awesome mega-fest such as the three day Hamvention held every April in Dayton, Ohio. However, they both have one thing in common. Today's fests cater to a wide range of interests because the hobby has branched out in so many different directions.

Besides ham gear, you are likely to find short-wave receivers, scanners, computers, antennas, satellite T.V., digital data decoders, accessories and a variety of new and used gadgets that defy categorizing. The possibilities are virtually endless, but one thing's for sure; it's almost impossible to walk away empty handed!

The author proudly displays his latest "catch"... a handheld scanner purchased at a bargain price!





This is a great time to ask: "What is it?"

How To Go Hunting For A Ham Fest

Even if you don't live in a major metropolitan area, chances are good that you are within reasonable driving distance of several good fests in the upcoming months. If you don't already know where they are, here are some tips for tracking them down.

Almost all fests are sponsored or organized by local radio clubs. If you know of one in your area, contact them. Radio shops and electronics stores also often have knowledge of upcoming events.

Don't be afraid to play detective. That guy down the street with a tower in his yard and a couple of strange looking antennas on his car probably knows some good stuff; all you have to do is ask! And don't forget to check out your issue of *MT* every month for the "Club Circuit" and "Special Event Calendar" columns. You can also monitor the 2 Meter VHF Ham Band between 144-148 MHz for inside information. Last but not least, once you are at a fest, be sure to pick up copies of flyers announcing upcoming events.

If you have a portable scanner, by all means take it with you. By monitoring the 2 Meter Band, you will not only hear directions to the fest, but may also be alerted to good bargains or other useful information once you are there. One or two specific frequencies are usually reserved for a particular event. If you haven't already figured them out in advance, just ask!

Tips For Buyers

Most larger fests attract two types of sellers. Commercial dealers or factory reps will offer mainly new equipment with full manufacturers warranties. They usually accept major credit cards for

purchases, and will supply you with solid documentation about the products they sell. If you are in the market for new equipment, many dealers offer reduced "Ham Fest Special" prices which can save you money. As always, however, shop around beforehand if possible, and make sure that what you are buying will suit your needs, and try to have a good idea of how much it should cost.

The majority of sellers you will encounter, however, truly embody what a fest is really all about: Recycling. You didn't know this was going to be a lesson in environmental prudence, did you?!

Trash Or Treasure?

It's all in the eyes of the beholder, of course. Used equipment is always plentiful because of a universal law which governs perpetual cycles. It's like the bike you inherited from your older brother, and later passed on to your younger cousin. The very nature of our hobby, coupled with the rapid advance of technology, challenges us to hone our skills and continue to learn; thus, the constant need to upgrade our toys. This in turn creates an endless supply of used equipment, ranging from the pathetic to the grandiose. Somewhere in between lies something we want, at a price we can afford.

Okay, you've spotted a used piece of equipment that interests you. Now what? Well, at this point there are three basic questions you need to ask. They are so universal that eventually you will recite them in your sleep. However, if this is your first fest, you may secretly write them on the back of your hand, and pretend to glance at your watch. The questions are as follows:

1. **"What is it?"** Don't be ashamed to ask. You may be surprised to find that the seller doesn't have the slightest idea either!

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Remember: haggling is part of the fun!

2. "Does it work?" My experience at attending hundreds of fests has taught me that the vast majority of sellers are honest and reputable. If you attend events regularly, you will often see the same people and get to know them. Unfortunately, however, there are always exceptions. If a vendor is inside of a building, it is possible to have access to an electrical outlet where the item can be demonstrated or tested. If the vendor is outside "tailgating," you may not have that luxury. Either way, you have to exercise your best judgment and gut instincts. Also, having the company of a knowledgeable friend can be invaluable. If you have serious doubts about an item for any reason, move on.

3. "What will you take for it?" Is the item clearly marked with a price, or do you have to ask? Is the price firm or flexible? These weighty questions bring us to the next (and very important), lesson.

The Fine Art Of Negotiating

Usually the price of an item will be clearly marked, but not always. You may be invited to make an offer, or be told that the price is firm. Either way, first be sure that the item will suit your needs and it is really what you want. Secondly, be convinced that it is worth the price and that you can afford it. Lastly, don't be afraid to ask the seller the lowest price he would consider, and don't hesitate to make an offer. It never hurts to ask!

Tips For Sellers

Now that you are in possession of some "good new stuff," you may be wondering what to do with some of that "good old stuff" you just replaced. Perhaps the time has come for you to work the other side of the fence. After all, today's buyers are tomorrow's sellers and vice versa. Isn't it comfort-

ing to know that the laws of the universe are still intact and operating like a well oiled machine?

To turn that "good old stuff" into cash, it's time to plan on being a vendor at the next fest. As always, according to that nagging universal law, you already have thoughts of purchasing some "good new stuff" with the proceeds. And don't be surprised if some of the "good old stuff" that you are selling at this fest, is some of the "good new stuff" that you bought at the last fest. Ah yes, it's all starting to make sense now!

If indoor vending is offered, tables and chairs are usually provided, and a nominal fee is charged "per table" or "per space." Sometimes space with electrical outlets cost extra, or are within nearby access. Depending on the fest, it is usually advisable to reserve indoor space in advance, although sometimes these spaces are still available on the day of the event.

Outdoor vending, or "tailgating," is usually free of charge (except for admission) and allows you to display your wares on the hood of your car, from your van, on a portable table or on the ground. While this can be the most economical (and sometimes most enjoyable) way to sell, you are also subject to the whims of Mother Nature. A tarp or plastic sheeting is invaluable in the event of a sudden rain shower.

The first rule of being a successful seller is to put yourself in the buyer's shoes. Display your merchandise so that it can easily be seen and touched. Don't leave things in boxes or stacked one atop another. Use index cards or labels to clearly identify items and their price. My biggest pet peeve is to see merchandise displayed without a price. Unless it is the one thing on Earth that I want more than anything else, I usually move on to the next space instead of standing around pointing and asking "how much?" On the other hand, I have often stopped to look at (and sometimes buy) an item solely because I was attracted by the price.

When I am selling, I occasionally step out into the aisle and look at my merchandise from the

buyer's viewpoint. This perspective allows me to rearrange items for maximum appeal. Also, having an item's original manuals and packaging available is a welcome touch.

Above all, be realistic when pricing your merchandise. Remember that people come to the fest looking for bargains just like you do. Nobody likes to take a loss, but if your prices are too high, you can count on dragging all that stuff back home. On the other hand, if you honestly think an item is worth more than someone's best offer, then stick to your guns. It might just be a matter of timing, and there's always another fest around the corner.

Don't ever rule out the possibility of a S.W.A.P. (Switching With Another Person). If you are looking for a particular item, let it be known with a sign or placard. Someone may just have what you want, and want something that you have.

As Mr. Spock once said, "The universe is unfolding exactly according to plan, and I find it to be totally logical!"

Expand Your Horizons

Besides being a good place for finding bargains and having fun, a fest is a great place to learn. No matter which diverse part of the hobby you are interested in, you can find books and magazines on the subject, as well as people who are willing to answer your questions and lend some good advice. If you are strictly into monitoring, you may be surprised at the number of clubs around which focus their attention on public service, aviation, railroads, marine, military, international broadcast, satellites, pirates and spies.

If you have ever thought about obtaining a ham license, but weren't sure where to start, look no further. Besides a large variety of books available that will take you from Step 1, the club sponsoring the fest may also have information on classes or meetings in your area. Some community colleges offer short evening courses such as "Introduction To Amateur Radio," and many clubs even administer license testing right at the fest. You can obtain books from the ARRL, from your local Radio Shack, or from *MT* advertisers that will prepare you for the new "no code" technician class license.

Last but not least, don't overlook the obvious that's right under your nose...no, not that silly mustache you've been trying to grow... I mean the issue of *MT* that you are reading now. The columns, articles and advertising contain a wealth of information that enables you to increase your knowledge, and thereby increase the enjoyment of your hobby. Resolve to expand your horizons this year...catch the fever...and see you at the next ham or computer fest!

MT

Photography courtesy of George Ashleman, KB9ENX. Special thanks to the Wheaton Community Radio Amateurs, Wheaton, IL.



Ron Seymour

Monitoring the Crisis on Old Man River

By Larry Van Horn, Staff Writer

As a rule, life on the Mississippi River during the summer months is not very exciting. While the Spring thaw brings flood waters which create havoc for residents and barge traffic alike, life along the river slows down during the hot, humid summer.

1993 is now the exception to that rule. This year's weather could certainly be classified as abnormal at best, as most residents of the East Coast and Midwest would attest.

The East Coast experienced the "Blizzard of the Century" earlier this year; now residents along Old Man River are suffering what some officials are calling the "Flood of the Century."

The Mighty Mississippi cuts through the heartland of the United States at a distance of 2,348 miles. It starts at Lake Itasca, Minnesota, and ends up at the Southwest Pass on the Mississippi Delta in Louisiana.

Flooding now occurring along the river has completely disrupted river traffic and the lives of river residents. According to PA3 Frank Dunn at the 2nd Coast Guard District headquarters in St. Louis, "We are only allowing traffic on the river on a case by case base. Due to the danger of runaway barges, shipments with perishable cargos are the only traffic moving on the river at this time." Dunn added, "The Coast Guard was assisting residents along the river with evacuations."

Gary Duhouse, a hydrologist with the Army Corps of Engineers in St. Louis, said, "The majority of the disruption to the river traffic on the Mississippi will probably occur from Cairo, Illinois, northward. South of that point, the river flattens out so they only expect minor flooding to occur."

Flooding has even forced the Coast Guard to close one of its offices. The Keokuk, Iowa, Coast Guard Group Upper Mississippi River has lost its VHF-FM communications center that is used by commercial and recreational boaters to report emergencies. Coast Guard units in St. Louis, Missouri, and Louisville, Kentucky, have picked up the radio guard until communications are restored at Keokuk, according to Coast Guard officials.

The Keokuk Group is normally responsible for search and rescue, and aids to navigation on the Mississippi River north of Cairo, Illinois, the Missouri and Illinois Rivers.

Listeners within VHF range of the Mississippi River who want to follow the action have several agencies they can monitor.

Marine VHF frequencies have been very active. A lot of vessels are communicating with the Coast Guard to exchange current information on river conditions. You'll hear both sides of the conversation on 156.300 (safety related), 156.350 MHz, and in 50 MHz increments up to and including 157.000 MHz. Try 156.875, 156.975, 157.025, and 157.425 MHz.

HF monitors do not have to be left out of the action. There are certain frequencies set aside in the marine HF bands known as Mississippi River working frequencies. These simplex working frequencies are used by vessels navigating the Mississippi River and the connecting navigable waters.

Look for activity on the following frequencies (kHz, USB):

4065.0	4089.0	4116.0	4408.0	6209.0	6212.0	6510.0	6513.0
8201.0	8213.0	8725.0	8737.0	12233.0	12362.0	12365.0	13080.0
16417.0	16543.0	16546.0	17299.0				

Of course a prime player during this type of crisis is the United States Coast Guard. The nationally-recognized VHF frequency for distress

announcements is channel 16, 156.800 MHz. The Coast Guard constantly monitors this frequency for trouble on the river. This channel is also reserved for call-up — one boat asking another to make contact on a certain stated channel. If you've programmed your scanner to include all the VHF-Marine channels from 156.275 to 157.175 MHz (every 25 kHz), you will instantly know when contact has been made because the vessels will identify themselves by name. Some other Coast Guard frequencies to watch include 157.050 to 157.175 (every 25 kHz).

Another agency involved with providing information on the flooding crisis is the Army Corps of Engineers (ACOE). The ACOE is responsible for the research, development, planning, construction, and maintenance of projects related to waterways such as the Mississippi River. This Army department also assists in recovery from natural disasters.

Listen to the following frequencies for ACOE communications:

163.4125/164.775 MHz.	Construction and Hydrology
163.4375/165.1875 MHz	Flood Control and Administration

Additional Corps VHF frequencies to watch include: 38.690, 38.890, 38.910, 163.5125, 163.5375, 163.5625, and 164.200 MHz.

HF listeners might want to keep an eye on the following ACOE HF Disaster Network frequencies (all transmissions in kHz, USB):

2064.0	2300.0	2326.0	2345.0	2348.5	2350.0	2602.0	2605.0
2627.0	3287.0	3290.0	3296.0	3302.0	3305.0	4850.0	5011.0
5015.0	5327.0	5346.0	5400.0	5437.5	6020.0	6785.0	6790.0
7360.0	8170.0	9122.5	9779.0	12267.0	16077.0	16245.0	16383.5

The Federal Emergency Management Agency (FEMA) has also responded to this natural disaster. On-scene information can be heard quite frequently on their HF networks. Look for HF activity on the following frequencies (kHz, USB):

2445.0	2658.0	3341.0	3379.0	3388.0	4780.0	5961.0	6049.0
6106.0	6151.0	7348.0	11957.0	12216.0	14450.0	14776.0	14837.0
14886.0	14899.0	14908.0	20027.0				

Also check the FEMA night/day emergency frequencies of 5212.0 and 10493.0 kHz. Look for VHF FEMA activity on these frequencies (all MHz):

138.225	139.225	141.725	142.350	142.425	142.925	142.925	142.975
143.000	143.225	153.225	164.8625	169.875			

AM radio band listeners do not have to sit on the river bank and be left out of the action, either. KMOX-1120 kHz in St. Louis has been broadcasting flood information at 55 minutes past the hour. Expanded coverage can be heard during morning and afternoon drive times. Since KMOX is a 50 kW clear channel station, listeners outside the primary coverage area should get good reception anytime after the sun has set in both St. Louis and the listener's location.

Other agencies will no doubt get involved as the crisis deepens. Check your references for National Guard and local public service agencies from the affected states.

As rain continues to fall and Old Man River continues to rise, it's time to dial up your HF radio, start a search on your scanner and tune in to the "Crisis on the Mississippi River."

M_T



Twenty-Five Years Ago in Prague

By Don Moore

With the fall of Communism in Europe several years behind us, it's hard to remember what Cold War tensions were like. Yet, twenty-five years ago this month, the Cold War became extremely cold when the Soviets invaded Czechoslovakia. As is so often the case in modern warfare, radio was there to play an important role.

The events that led up to the invasion began on January 5, 1968. With the economy in bad shape, there had been unrest among both the Czechoslovak people and the ruling Communist Party. First Secretary Antonin Novotny and his hardline compatriots responded with the usual suppression, but the rest of the party elite revolted, voting him out of office and replacing him with Alexander Dubcek. Gradually Novotny and his allies were pushed out of most important party and governmental posts.

Dubcek and his faction launched a reform campaign unheard of in the Soviet block. Under the slogan "socialism with a human face," they ended press censorship, freed political prisoners, allowed free travel abroad, began decentralization of the economy, and totally turned the old Stalinist system on its head. Others dubbed the awakening the "Prague Spring." Yet, Dubcek's government continued to insist that it supported Communism and planned to remain allied to the USSR, especially in foreign policy matters.

Nevertheless, Moscow saw Dubcek's movement as a threat to its dominance in Eastern

Europe. Tensions between the Soviet and Czech governments rose as the Soviets denounced the reforms and worked behind the scenes with Dubcek's opponents. But, Dubcek remained solidly in control. At the end of July, Dubcek and Soviet leader Leonid Brezhnev and their advisors met for several days, and produced an agreement called the Bratislava Declaration, which seemed to guarantee Czechoslovakia's freedom to follow its own path.

The Invasion

In reality, everything was far from rosy. Secretly, the Soviet government had been preparing an invasion of Czechoslovakia under the guise of the Warsaw Pact. At 2200 UTC on August 20, at least 250,000 Warsaw Pact troops — mostly Soviets, but also East Germans, Poles, Bulgarians, and Hungarians — crossed into Czechoslovakia.

News of the invasion traveled slowly to the capital, and not until 0100 did Czechoslovak Radio broadcast the first news of it to a startled world. A nearby Associated Press office monitored the broadcast and relayed the news to the world. It reached American TV audiences at 0125 (9:25 p.m. EDT), about the same time the Soviet ambassador visited the White House to inform President Johnson. Shortwave listeners, however, reported that Radio Prague's external services carried on with their

normal prerecorded broadcast, without any mention of the invasion.

As the invaders moved into key towns and eventually Prague itself, they took over government buildings, intersections, and other strategic points. Reformist leaders, including Dubcek, were captured and arrested. Everything started out very smoothly, just as expected. But, the Soviets had no idea of what really awaited them.

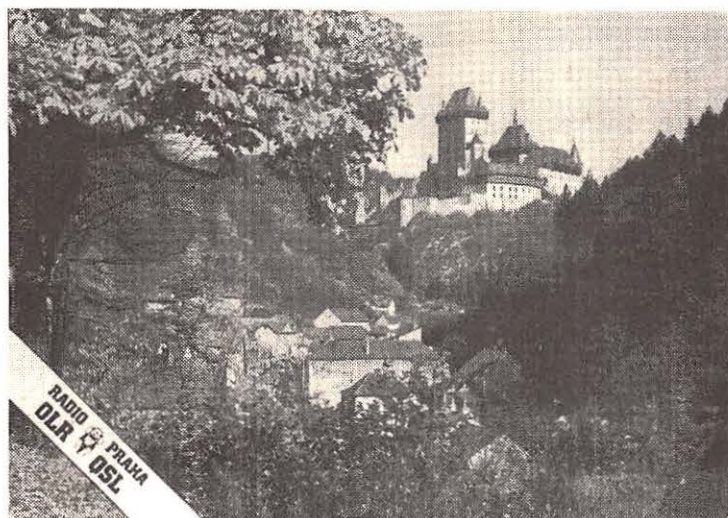
Battle for Radio Prague

The Soviets knew that controlling the flow of information would be key to the success of their invasion. But, the Czechoslovaks knew that also. The Prague Radio Building on Vinohradska Street, just behind the National Museum in the Central City, would be the center of resistance. Within minutes of the radio's invasion announcement, Czechoslovak youths began gathering on Vinohradska Street. Using wood, stones, buses and trolley cars, they began constructing massive barricades across the street.

At 8:00 a.m. Soviet troops surrounded the station building. A woman announcer reported this to the listeners, noting that, "They are going to silence our voices, but they cannot silence our hearts." The microphone was passed from hand to hand as the announcers asked the audience to remain calm and have courage. One man held the microphone to the window so the listeners could hear machine gun fire outside. As her companions sobbed in the background, the first woman announcer came back on and reported, "They have entered the building, but we are still here and will be with you as long as we can hold out ... we are behind Dubcek and we will never give up, NEVER." Then the national anthem was played.

In fact, the troops hadn't entered the building yet. As they moved onto Vinohradska Street they were met by thousands of people waving Czechoslovak flags and screaming, "Russians, go home!" When the tanks moved towards the barricades, students ran out on the street with Molotov cocktails and flaming rags and newspapers to set the tanks on fire. Old mattresses, garbage, and wooden crates were added to the fires. The invaders were shocked by the strong resistance. They retreated, leaving one tank and two munitions trucks in

"Prague Spring" reforms blossomed for a few short months. In August, the Soviet troops moved in.



flames in front of the barricades. Radio Prague would remain on the air a little longer. But, the Soviets regrouped and a few hours later launched another attack, this time smashing through the barricades. Just before 11:00 a.m., troops stormed into the radio building, the last place in Prague to fall. The station went off at 11:00 a.m.

Surprisingly, only seven Czechoslovaks were killed in the two battles for the radio station, out of a total of 23 killed in Prague and other cities. Later in the afternoon, thousands of citizens carrying a blood splattered flag made a funeral procession along Vinohradska Street in honor of the fallen in the battle for Radio Prague.

Radio Leads the Resistance

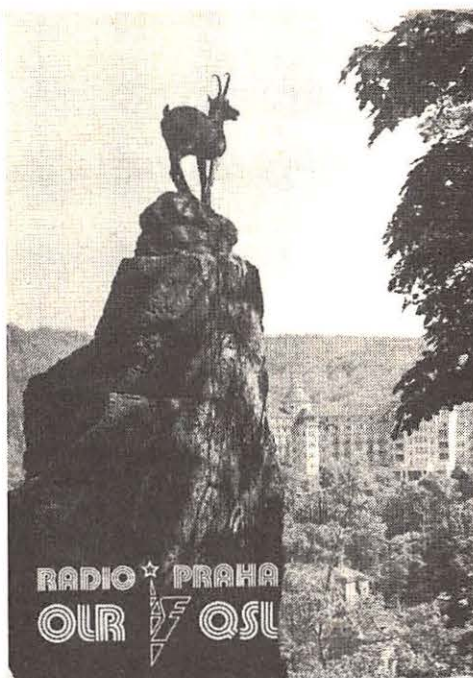
Contrary to their earlier declarations, the staff did not wait around for the Soviets to storm into the studio. A few people, including Director Karel Hrabal, stayed at the microphone until they were arrested. But most of the technicians, announcers, and reporters slipped away into the crowds once it was apparent the building would fall. They were not deserting their cause in its hour of need. They had plans for another fight that the Soviets hadn't counted on.

Within half an hour of Radio Prague's fall, a clandestine anti-Soviet broadcaster came on the air in Prague. Gradually others were added elsewhere in the city, and in cities such as Brno, Pilsen, and Ceske Budejovice. Around the country, local radio staffs left their studios and took to the airwaves from secret locations.

At first, the clandestines provided news and moral support for the resistance. As they became more organized, the stations actually began to orchestrate the resistance. Then, as the resistance centered on the clandestine network, the stations became a sort of quasi-government for a nation without a real one. Their slogan was "Jsme s vámi; bud'te s námi!", or "We are with you; be with us!"

Although the underground stations denounced the Soviet invasion, they always stressed their loyalty to the Socialist system as represented by Dubcek and his "Prague Spring." Rather than being anti-Communist, they supported a liberal form of Communism. And they always pointed out that they were "free, legitimate" radio stations of the Czechoslovak people.

Surprisingly, in concentrating on closing down official Czechoslovak radio studios, the Soviets didn't bother to occupy several key medium and long wave transmitter sites. Radio technicians then set up make-shift studios and connected them to the usual high-powered transmitters on their normal frequencies! This not only made it easy for local listeners, it allowed BBC monitors at Caversham Park to record almost all of the key output of the clandestine broadcasts during the first few days of the invasion. Soon, however, the Soviets wised up and occupied the transmitter sites, too.



By this time, the free radios had set up a hodgepodge of truly clandestine transmitters. Some came from the Czechoslovak army and others from factories, especially the Tesla Electronics Equipment plant. In other cases amateur transmitters were pressed into service. Still others were put together at the moment with whatever parts were at hand. As one staffer with the clandestine network said, "We always swore about our obsolete equipment, which was always breaking down, but it made our technicians into masters of improvisation, and that is what they are now." Equipment was limited, however. For example, often listeners were asked to record the broadcasts for future generations, as the stations lacked the equipment to do so.

The stations worked together, and soon a true clandestine network came together. Up to nineteen stations took turns broadcasting for fifteen minutes at a time on the same frequency. Each station had local and national news, plus coded messages for members of the resistance. Numbered codes signaled the end of a transmission so the next station in the link could come on. At first the breaks between stations were choppy with as much as five minutes of dead air. Later the engineers became so proficient that the switches were often not even noticeable. During their time off the air, some stations moved their transmitter to a new site before their next turn, as a further guard against discovery.

The network operated 24 hours a day, giving the announcers and technicians little chance for sleep. Listeners provided food and other supplies. In some cases stations made live broadcasts from streets or parks; watchful citizens warned them if the Soviets were coming near.

Most programming was news about the invasion and resistance against it, but this was no propaganda operation. The broadcasts were always objective, telling good and bad. Sometimes

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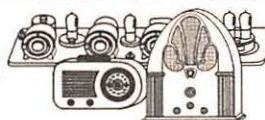
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it was difficult to get accurate information, but when information turned out to be incorrect, it was always corrected on the air as soon as possible. Everyone at the stations knew that the truth was important to their people. The quiet, calm, unemotional reading of news and announce-

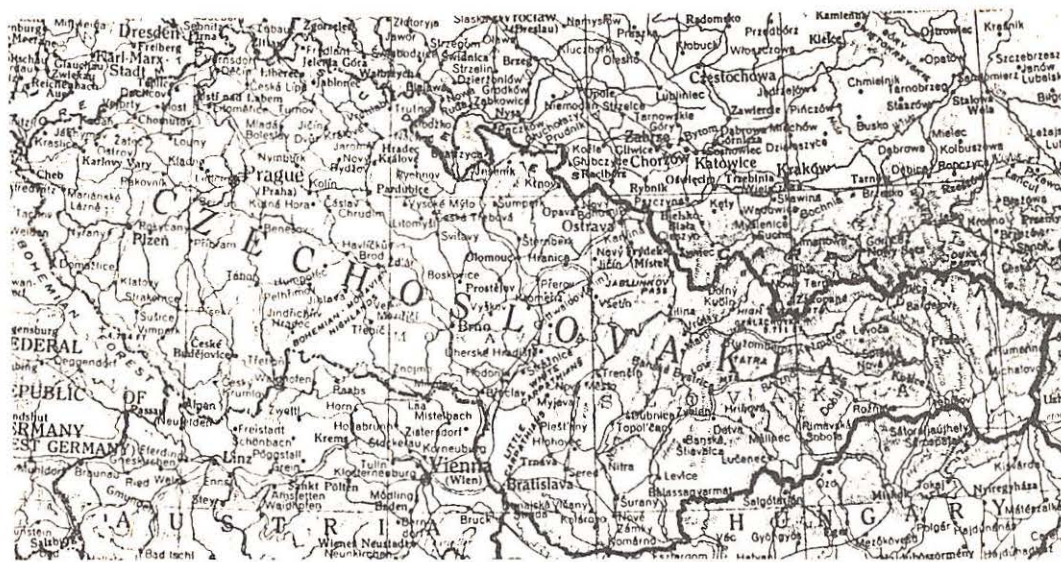
ments on the free radio stations became the symbol of the resistance. Still, with highly critical events, women announcers were used because it was believed their voices would create a more emotional reaction in the audience. Only a few breaks were taken for music, and those were to allow the announcers time to compose upcoming news and announcements.

Most of the broadcasts were on medium wave, but several, including Radio Bratislava, used short-wave. Frequencies included 233, 428, and 492 meters on medium wave and 1103 meters on longwave. In Prague, the international service's normal 7345 and 11990 kHz outlets were taken over by Radio Free Prague with lower-powered clandestine equipment. Both frequencies were logged in North America. The invasion gave DXers some unwanted signals to tune in as well; the Soviets began jamming the VOA and BBC for the first time since 1961.

While Czech and Slovak were the primary languages used, clandestine broadcasts were also aimed at the invading troops and listeners abroad. Other languages used at different times included Russian, Polish, Ruthenian, Hungarian, Romy, German, French, and English. When appeals in Russian for the soldiers to go home were broadcast, listeners took their transistor radios out into the streets and held them up so that the soldiers could hear.

The clandestine operators didn't limit themselves to radio, either. They put on at least four underground TV stations. The broadcasts were highly professional, and in addition to news carried a lot of comedy programs making fun of the invasion.

Humorous Russian lessons were especially popular, as was a satirical tour for visitors of the sites of occupied Prague. Ironically, the Soviets were indirectly responsible for the clandestine network. Years before they had suggested that Czechoslovak radio make plans for clandestine operations in case of a Western invasion. Soviet



Rand-McNally

generals in 1968 probably wished that the Czechoslovaks hadn't been so compliant on this one instruction!

Passive Resistance

The stations reported fighting against the invasion in many cities with many dead and wounded. A few broadcasts even ended with the sounds of Russian troops storming in, firing machine guns. Yet, this was not the way Dubcek or his supporters wanted it. The Free Radio stations always urged passive resistance; no one wanted another 1956 Hungary, when hundreds were killed fighting Soviet troops.

On August 22 at noon, 20,000 people demonstrated in central Prague's Wenceslas Square as part of an hour-long general strike across the country. As cars and buses stopped in the streets, everything was paralyzed, even the invaders' military traffic. But, when an evening demonstration was planned and the Soviets threatened to impose martial law, the free radio network urged the demonstration be canceled, and no one showed up. Young people stood on nearby streets and directed passers-by to take other routes so the square would remain empty.

Instead of confrontation, listeners were told how to resist without getting shot. School children, who learned Russian in school, were told to pretend they didn't understand the language if questioned by soldiers. When KGB agents were identified, the license numbers of their cars were given to the stations for broadcast. Listeners then painted the numbers everywhere. It may not have stopped the KGB, but it certainly made them spend a lot of time changing cars!

One of the easiest and most effective way to resist the invaders was to confuse them. The Soviets and their allies did not know their way around Czechoslovakia and its cities and towns. House numbers were taken down and street and highway signs were switched around. In some

towns, all the street signs were renamed Dubcek Street. When the resistance learned of additional Polish troops coming in along a certain route, listeners were told to change the road signs. The column followed the signs and about the time they expected to be arriving in

Prague, they found they had taken a circuitous route back to the Polish border!

The free radios also urged compassion. Most of the invading soldiers were naive 18 year old Russians. Listeners were told to treat them kindly, as the soldiers were not responsible for their actions and often didn't even know where they were. Some units had been told they were invading Germany and others that they were putting down a rebellion in the Soviet Ukraine. The stations also discouraged listeners against taking action against Czechoslovaks who were collaborating with the invaders. Not only was this against the spirit of passive resistance, in many cases the evidence against supposed traitors was little more than gossip. In one instance, a man spying for the resistance by collaborating with the Soviets was beaten up by other members of the resistance.

The Soviets Strike Back

Although the Czechoslovak clandestine broadcasts caught the Soviets by surprise, the Soviets had their own clandestine stations, too. Just a few hours after the invasion began, Radio Vltava came on 210 meters, claiming to be a Czechoslovak station and justifying the invasion as the will of the Czechoslovak people. The broadcasts, however, were in Russian-accented Czech and broken Slovak. The free radios announced Radio Vltava's frequency to their listeners and invited them to listen to it for amusement.

Radio Vltava was actually located in East Germany, and eventually its frequency was taken over by Radio Berlin International. Later at least three other Soviet-operated clandestine stations broadcast briefly to Czechoslovakia. One, Vysilac Zare (Dawn Transmitter), pretended to be pro-Dubcek, but careful monitoring proved it to be a subtle attempt at spreading disinformation among the underground.

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Of course as soon as the Soviets realized the scope of the free radio network, they set out to close it down. However, the use of multiple and ever-changing frequencies and locations made triangulation to find the stations difficult if not impossible. Furthermore, the Soviets had been so confident of an easy invasion that they hadn't even brought along the equipment to do it, and it took several days to get it shipped in. Meanwhile, the Soviets frequently drove right by clandestine studios without even knowing it. Gradually, frustrated officers began ordering their troops to confiscate transistor radios out of people's hands in the street.

When the Soviets tried to bring jamming equipment from Poland to Prague, the resistance found out and Czech engineers refused to run the trains bringing the equipment in from the border. When compliant engineers were found, someone cut the electric line powering the train, delaying it still more.

Finally, the invaders located a list of government-registered hams and the troops systematically began shutting them down one by one. Indeed, quite a few had been using their equipment to relay the clandestine broadcasts. Direction-finding equipment and police state tactics helped them shut down more stations. Others stations realized the fight was over and shut down on their own.

By Wednesday, August 28, most clandestines were off the air. One of the last messages was "People, from now on you will have to think about

what you read and hear. You have always been good at reading between the lines. Now our writers will have to practice the art of writing the truth by concealing some of it..." On Thursday, August 29, the last free radio station, on 950 kHz at a location near the Austrian border, closed down. The radio battle for Czechoslovakia was over.

Epilogue

In the end, the Czechoslovak clandestine radio network only delayed the eventual Soviet takeover. But, it did show how easily radio can be used to bring together a vast passive resistance movement, and that people dedicated to a cause can make a difference. The Soviets may not have been defeated on the streets, but they were clearly routed on the airwaves.

Thanks to the passive resistance sponsored by the clandestines, the political battle for Czechoslovakia cooled down. The Soviets were not interested in the political embarrassment of a long difficult occupation, and Dubcek and his government supporters realized that they could never defeat the USSR. The two sides reached a compromise in favor of "normalization." The Soviet troops withdrew from government buildings, including radio and TV facilities, to camps outside the cities. Dubcek's government was returned to power, intact. Theoretically, life continued for Czechoslovaks

with the freedoms of before the invasion, but it was difficult to take advantage of them with the invaders watching nearby.

This stalemate continued until March 1969 when a Czechoslovak ice hockey victory over the Soviet team at an international match produced a wave of anti-Soviet protests and vandalism across Czechoslovakia. This caused Moscow to send a high level delegation to Prague. Either Dubcek and his most important advisors would resign, or there would be another intervention.

There was no question that with the current tensions the new invasion would be far bloodier than the first. Dubcek and his allies resigned and Gustav Husak, a close Soviet ally, took over. Husak set about systematically to dismantle the "Prague Spring" and return Czechoslovakia to a hardline Communist rule that would last until once again the people of Czechoslovakia took to the streets, in December 1989, to overthrow Communism for good.

MT

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AMARC:

Social Change Through Community Radio

By Peter Gellert

Community radio is more than just alive and well in Latin America; it is a vital media tool for those traditionally considered locked out of dominant, multinational communications — the tens of millions of Indians, impoverished urban slum dwellers, rebellious youth, intellectuals, feminists and ecologists.

Nowhere was this more dramatically reflected than by the 400 delegates to the Fifth Congress of the World Association of Community Radio Broadcasters (AMARC, for its initials in French), held last August in Oaxtepec, Mexico.

The Congress presented a living testimony to the growth of an alternative communications media, particularly in Latin America. For the large contingent of Latin American delegates, who were a clear majority, it was a long-awaited opportunity to exchange experiences, information, technical knowhow, and materials, and to meet with their counterparts from other parts of the world.

It was a difficult and costly trip for many. Airplane travel is expensive within Latin America and most community radio stations operate on a shoestring budget. Some delegates had hassles at borders and immigration stations. Several Peruvians were reportedly detained and deported

from the Mexico City International Airport, accused of ties with terrorist organizations.

While the Congress showed that community-based radio is a worldwide phenomenon, its greatest impact and presence is undoubtedly in Latin America. Specialists speak of about 500 serious, stable community radio broadcasting stations south of the Rio Grande, and thousands of more localized ventures.

"We don't define community radio by how powerful its transmitters are or how it is financed, or whether it is privately or state owned; the bottom line is if the radio station contributes to building community solidarity and democracy," Jose Ignacio Lopez Vigilio, representative of the Latin American office of AMARC explained.

"Our basic motto can be summed up as 'Democratize the airwaves to democratize society,'" Lopez added.

Due to high illiteracy rates which limit the circulation of newspapers, and poverty which restricts access to television, radio is a key communications media. And nowhere is the experience in community radio as rich and varied as in Latin America.

"One unique Latin American experience is the progressive Catholic radio stations," Lopez said. Stations such as Radio San Gabriel in Bolivia, Radio Onda Azul in Peru and Radio Latacumbra of Ecuador express the liberation theology currents in Catholicism which have attempted to fuse Christian precepts with a firm commitment to social struggle.

Also particular to Latin America are the free radio stations of Brazil. Hundreds of such stations have been organized by youth groups seeking a cultural expression to their feelings of rebellion against society. These stations are usually based in specific neighborhoods, often as an outgrowth of the urban popular movement.

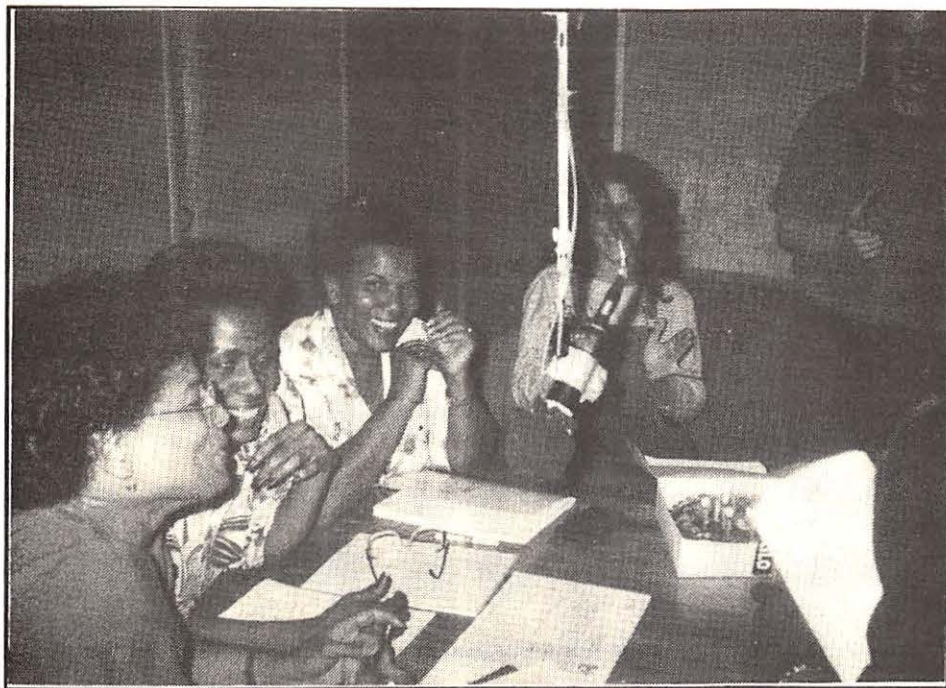
In addition to the labor and peasant organizations, the urban popular movement has been a permanent feature of Latin American political life for the past several decades. Coalitions have sprung up to demand social services, paved roads, running water, electricity and housing in the sprawling cities of Latin America, often becoming mass movements involving hundreds of thousands. When these organizations spring up, so does community radio.



Above: Nancy Vargas broadcasts for the Feminist International Radio Endeavors (FIRE) in Costa Rica.

Right: Indigenous community radio broadcasters addressing the plenary session at AMARC 5, Oaxtepec, Mexico.





LOUISE BOVIN

Members of the Ondes de Femmes (Women's Airwaves) Collective on-air at Radio Centre-Ville, a multi-cultural station in Montreal, Canada.

Low-powered stations proliferate, for example, in Argentina. More than 40 such stations exist in the Chilean capital of Santiago alone.

Breaking the Language Barrier

An outstanding feature of the AMARC congress was the growth and consolidation of Indian language radio. The most important experiences in this field, according to Lopez, have been Mexico's National Indigenous Institute. During the past two years, this institute has extended the network of local stations broadcasting in the country's varied Indian languages, and encouraged the use of Quechua and Aymara in Bolivia, Peru and Ecuador.

Although such radio stations often broadcast with low powered transmitters and operate on a make-shift basis with a limited budget, they are, in fact, the only ongoing and successful attempt at making Indian languages relevant, living tools for daily communication in the modern world. Due to their centralized and expensive nature, TV and newspapers simply do not respond to this challenge.

In fact, the Congress often appeared to take on the character of a Native people's conference, with delegates dressed in traditional garb explaining how their radio stations operate, their problems, trials and tribulations. During evening breaks, organized and informal cultural events took place, ranging from traditional Mexican folkdances, with a recital by the state folkloric ballet, Indian music from South America, the new song movement, and videos on Haiti and El Salvador.

Although Indian delegates were present from North and South America, as well as Aborigine radio broadcasters from Australia, delegates from all nationalities shared a keen appreciation of the need to preserve Indian and Aboriginal culture and the pivotal role of alternative radio as the communications media most likely to do so.

In Bolivia the powerful labor movement, historically based among tin miners, has its own network of miners' stations. Radio stations in the Siglo XX and Huanuni mines, for example, have played a role in popularizing community struggles, broadcasting in indigenous languages and even spearheading resistance to Bolivia's numerous military coups.

Educational stations such as Radio Fe y Alegria of Caracas, Venezuela, and Radio Santa Cruz in Bolivia play a role in promoting literacy campaigns and basic education.

"Unofficial" Stations

Lopez emphasizes the special role of the clandestine or rebel radio stations, a unique reflection of the Latin American experience in armed struggle.

Broadcasters such as Radio Venceremos and Radio Farabundo Marti in El Salvador, Colombia's Radio Patria Libre — sponsored by the Simon Bolivar Guerrilla Coordinating Committee — and the Guatemalan National Revolutionary Unity's Voz Popular, have accompanied guerrilla movements in situations where armed conflict has limited the freedom of the press.

A special workshop was held for representatives of the clandestine stations, complete

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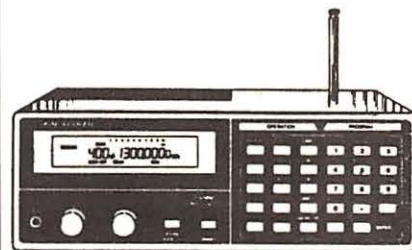
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with videos, pamphlets and posters. The Salvadoran representatives explained the problems and challenges facing Radio Farabundo Martí in making the transition from underground functioning to an open, legal radio station.

Finally, Cuba's 36 radio stations are considered community radio, despite state ownership. AMARC voted to accept the Cuban stations into membership due to their role in defending community and social interests in the island republic. Josefa Bracero, Vice-President of the Cuban Radio and TV Institute, held a special meeting with Latin American delegates to discuss the situation in Cuba and the increasingly important role of radio, given severe paper shortages that limit the printed media.

With such a wide variety of stations falling into the category of community radio, it makes one wonder what common threat could possibly unite them? But that's the wrong understanding of what community radio is, according to Lopez. "We define community radio as an alternative to the established and dominant communications media because of its critical approach to resolving society's problems, not because the stations defend a particular political program," he emphasized.

For Luis Davila, Ecuadoran researcher and AMARC Vice President for Latin America, community radio in industrialized and in developing countries are two distinct phenomena.

"In the First World, community radio fights for the rights of minorities such as gays, oppressed nationalities, women; while in the Third World community, radio is the voice of the majority, or to be more precise, the majorities," Davila argues.

And television? Radio specialists explained that community or alternative experiences with TV have been few and far between. Its most notable example is in Caracas, Venezuela. While television can give radio a run for its money, among housewives busy with domestic chores, taxi, bus and truck drivers, radio is still number



What is AMARC?

Not to be confused with ANARC (the umbrella organization for North American radio clubs), AMARC is an international organization serving the community radio movement. The letters stand roughly for Association Mondiale des Radiodiffuseurs Communautaires, or World Association of Community Radio Broadcasters.

AMARC supports community-based, participatory broadcasts that provide an outlet for the voices of social change, cultural development, and democratization. Programs by and for women and indigenous people receive special encouragement. Through such means as international conferences and its newsletter *InteRadio*, AMARC facilitates the exchange of ideas, technology, programs, and moral support.

You can join AMARC as an individual, organization, or broadcaster. To inquire about membership rates and the newsletter, which is published three times yearly in English, French and Spanish, write AMARC Secretariat: 3575 boul. St. Laurent #704, Montreal, Quebec H2X 2T7, Canada; or call 514-982-0351; Fax 514-849-7129; Telex 063670997. Latin American Office: Avenida Brasil #2038, Lima, Peru; Tel/Fax (51-14)63-14-36.

one. The poor quality of most Latin American TV programming and radio's ability to use scarce resources to produce interesting programs also helps cushion the gap between the two communications media.

Playing "Catch Up" with Technology

A constant concern of radio specialists is to guarantee the survival of community radio through incorporating technological innovations. At the AMARC congress, for example, representatives discussed the viability of creating informational networks, including an regular Indian news program, greater use of modems, satellite communication and satellite dishes.

In Latin America, all this technology is still quite new, even for participants in AMARC. The technical gap separating the industrialized and developing countries is greater than ever before.

For Davila, the challenge facing community radio is to compete with the large and powerful communications media, radio or otherwise. Key to his strategy is that he calls "removing the

chastity belt of refusing to accept paid commercial advertisements."

At the same time, Davila urges caution. "The question of technical innovation is important, but not pivotal." Whether a station has the ability to purchase digital equipment or not is of limited importance. "Our experience shows a radio station can be put into operation with quite limited financial resources," he said.

The advent of audio digital broadcasting is a dark cloud on the horizon, however. This new technology allows CD quality reception, but DAB's satellite transmission strictly limits the number of stations capable of broadcasting and its cost is prohibitive for community radio.

Community radio activists face the future with confidence, nonetheless. Concrete projects to develop and improve peasant farmer radio stations, children's programming, coordination among indigenous broadcasters, exchange of programs and materials, and greater attention to ecological and feminist concerns were all signs of AMARC's relevance to community radio, both in Latin America and beyond.

MT

Interviewing young mothers for a radio program in Niger.



PASCAL BERQUÉ, GRET

Steve and Elwood's Weird Monitoring Adventure

By Steve Douglass

Does adventure seek me or do I seek adventure? After the monitoring safari I just finished I find myself wondering. After fifteen years in the hobby, you'd think monitoring would border on the humdrum by now. To the contrary; I think the more I get involved in the hobby, the more strange stuff seems to come my way. In any event, this latest adventure was one of the weirdest.

This year I planned to visit Southeastern and South Central New Mexico. In particular, I planned to do some military monitoring near Roswell which is surrounded by Military Operations Areas and Alamogordo, home of Holloman Air Force Base. Holloman is where all F-117A stealth aircraft are based and rumors also abound that the TR-3A and a hypersonic "pulsar" aircraft may be fielded there as well. Another monitoring target in the area is the huge White Sands Missile Range, a test site for everything from missiles to warplanes. These reasons were more than enough to get me to pack my bags and my scanners and hit the road.

My scanner buddy on this trip would be Elwood Johnston, a frequent Federal File contributor and good friend. He also happens to be my father-in-law. Elwood had just recently been bitten by the scanner bug and was eager to go on his first monitoring safari, but neither of us could have anticipated the events that awaited us.

We had just stopped to top off the gas tank

at a little station just outside of town, when we had our first encounter. There were many cars waiting to fill up and we took our place in line. Suddenly a blue mini-van raced into the parking lot and screeched to a halt, stopping barely in time to keep from hitting the pumps. A crying woman jumped out and ran up to a man who was busy pumping gas into his truck. The man hung up the hose and ran over to the van.

Soon it was apparent what all the commotion was about. The man ran into the gas station clutching a baby that wasn't moving. The scanner in our car came to life as the first radio calls for help rang out. "Attention Rescue Three, respond Code 3 to the gas station, on Interstate 27 and FM-2219 on an infant not breathing." Inside the gas station I could see the man who had only stopped to get gas, frantically giving CPR to the tiny infant laid out on the counter. Soon the gas station parking lot was filled with rescue and ambulance workers rushing to the child's aid.

Not wanting to be in the way of the rescue operations, we decided to go elsewhere to get fuel. But we listened intently to ambulance reports on the condition of the child.

The baby was apparently choking on an object stuck in her windpipe. Once the object was removed, the baby began breathing again before it reached the hospital. Leaving the flashing lights and wailing sirens behind us, we headed towards Roswell.

A Dangerous Underestimation

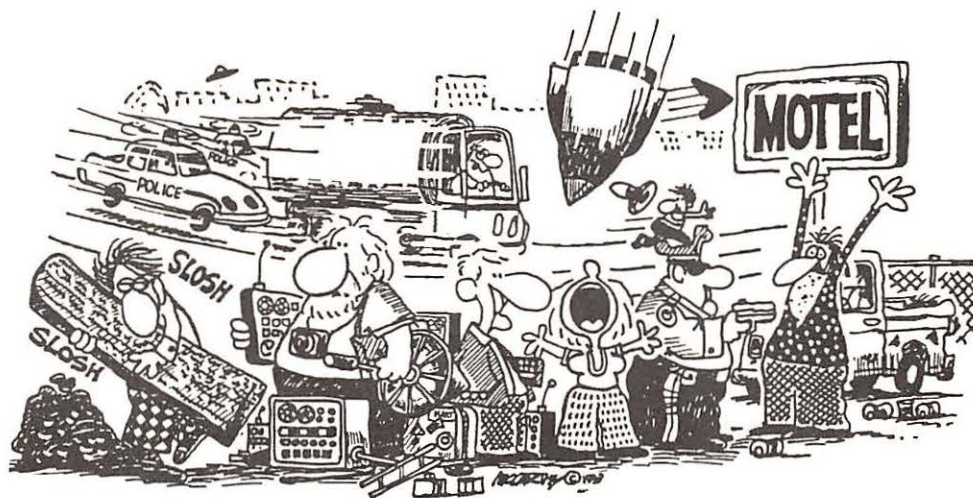
The drive to Roswell was quiet. Outside of Roswell we were greeted by a herd of prairie antelope that raced our car. Just then, the scanners came alive as fire units rushed to a grass fire that had started just north of town. I realized that we were entering town from the north and began searching the horizon for smoke. Off to our west was a small smoldering grass fire that was really nothing to write home about, but a steady 30 mph wind was trying its best to get the fire going.

As we entered Roswell we were passed by fire trucks heading for the fire. By the time they arrived, the small grass fire had grown in to a raging prairie fire and was out of control. Smoke blowing across the highway we had just been traveling reduced visibility to zero and a major traffic pile-up occurred, resulting in many serious injuries and closing the main highway into town for several hours. Elwood and I were thankful that was one adventure that just missed us.

The military monitoring from Roswell was first rate. From the BEAK MOA to the West could be heard jet jockeys in mock combat. Like something out of Top Gun, pilots could be heard grunting into their microphones as they pulled heavy G's struggling to get their F-15s and T-38s behind a bandit that had just shot at them.

These exercises would start just after sunset and last until just before sunset. Most of the aircraft were from Holloman AFB with some of them coming from Reese, Cannon and Kirtland AF bases. Some of the pilots had thick foreign accents, which gave them away as German and Taiwanese pilots who were also being trained by the USAF at Holloman.

Just after sunset, the radios would go quiet as the fighter pilots headed to their bases and beer call after a long day of dog fighting. As soon as it was dark the radio action would begin again as the night movers took to the skies. To the South in the Talon MOA, F-117s from Holloman would make mock bombing runs on the oil refineries in Artesia. Sometimes in groups of two or three, or sometimes alone, they would hit the area's oil complexes, possibly pretending they were flying into Baghdad or some other Middle Eastern petroleum state.



To the North, F-111s from Cannon, AFB and B-1Bs from Dyess AFB could be heard bombing unmercifully the pretended enemies dug into the Melrose Bombing Range. All the bombing sorties would take place well after dark and into the wee hours of the morning. Many of the aircraft could also be heard refueling with KC-135 tankers from Altus AFB, Oklahoma, on AR-602, 623 and 644.

After spending two days in Roswell it was time to pack up our gear and head to Alamogordo, Holloman AFB and the White Sands Missile Range.

Alamogordo is definitely a military town. In every park and rest stop are pieces of defunct military hardware (such as missiles and airplanes) now serving as playground equipment for the local yard apes. What once was a terrible symbol of the Cold War now has scrawled on its metal fins "Seniors 93."

It is also apparent that the F-117A stealth attack aircraft is based in Alamogordo. What once was one of the Pentagon's best kept secrets is now displayed openly on billboards selling real estate, advertising bowling alleys and mobile home parks. This once camera-shy stealth aircraft now flies in the open and in broad daylight over a town so used to its appearance that they don't even look up when it passes over. That certainly wasn't the case for myself and Elwood as we were delighted when an F-117 buzzed our motel room.



We set up our "monitoring post" in the motel room which was situated on the second floor. Our room faced west and gave us a good view of Holloman AFB which was about five miles away. The rest of the evening Elwood and I spent listening to the fascinating communications coming from Holloman and the White Sands Missile Range. A few hours later, however, the real adventure would begin.

At about 2:00 am, what seemed like the loudest screeching noise I have ever heard woke us from a deep sleep. Immediately awake, I looked outside to see what was the source of the terrific racket. In the parking lot a pickup truck had skidded to a stop and barely missed Elwood's car. More screeching filled the air as police cars slammed on their brakes and instantly surrounded the truck. A woman, crying and screaming, jerked open the driver's side door and ran over to the police who now had their guns drawn and pointed at the driver of the truck. Reluctantly the driver of the truck came out with his hands up and a policeman threw him on the ground and handcuffed him. More police cars poured into the parking lot and soon the whole motel was awake

and peering out their windows to see what all the commotion was about.

In all the excitement, I had almost forgotten that I had a room full of scanners. I turned on the PRO-37 I had brought and searched for the frequencies the police were using. I was instantly rewarded when the scanner came alive with police calls.

Apparently what caused all the commotion and disrupted our sleep was the abduction of the woman by the man driving the truck. He had forced the woman by knife point into his car at a local nightclub. The woman signaled her distress to a passing motorist who called the police on a cellular phone and followed the truck in his own vehicle. When the police caught up with the abductor, he led them in a merry chase that ended below our motel window. When the arresting officers ran a make on the guy it turned out he had already been arrested before (three times) for rape and attempted rape. I didn't mind our front row seat to the live police drama; I just wished they would have scheduled it for prime time.

The next morning, Elwood and I made our way down towards the base. Both of us were a bit bleary-eyed after staying up to watch the excitement taking place in the parking lot. I hoped to catch some F-117s on film (and video) along with some juicy military monitoring as well. We picked a spot on the highway that ran by the base and for the first couple of hours watched T-38 jet trainers do touch and goes. Around noon we saw our first F-117s take off from Holloman to the North, but they were too far away to photograph. In the span of an hour three other Nighthawks took off and disappeared off to the North to attack some targets on the White Sands Missile Range.

At one point two triangular shaped aircraft passed overhead at high altitude that weren't F-117s. I shot some video of them as they flew over (very fast) but they were too high to make out what they were in the video. They may have been super-secret TR-3As, but at the altitude they were flying at I couldn't say for sure.

About an hour later the F-117s began returning to Holloman. I could hear them talking to Holloman Approach from about twenty miles out. Their flight path would take them right over our position and we would get an excellent view of them.

The first F-117 came in low and slow. I was struck by how strange the aircraft looked. Black, angular and menacing, they made me wonder what the first civilians to see them flying into Tonopah must have felt. Although I have seen F-117s on many occasions, I am still awestruck.

I snapped away as the returning stealths passed overhead. A pair of F-117s came in flying line abreast. On the scanner I could hear the instructor in one F-117 relaying instructions to the student in the other. The student landed and

the instructor's F-117 peeled off, came back around and landed also.

A few minutes later another F-117 with a T-38 flying on it wing, appeared off to the East. It flew south of our position and circled while some T-38s and an F-4 landed. Then both the T-38 and the F-117 turned towards us. What a great shot, I thought and positioned myself so they would pass overhead. As the pair flew over I heard some sirens at the base go off and some strange warbling tones over the scanner. On almost all of Holloman's frequencies came the same message, "Attention all stations, we have an aircraft emergency .. An incoming F-117 has live ordnance hung up in its bomb bay .. The Bomb Disposal Unit is needed on the dearming pad immediately!" Needless to say I was a bit surprised to find out that the aircraft that had just flown over my head had a live bomb dangling in its bomb bay.

To make a long story short, the aircraft landed safely and we headed back to the motel room where things were probably a little less exciting. Or so I thought.

A Hot Night in Alamogordo

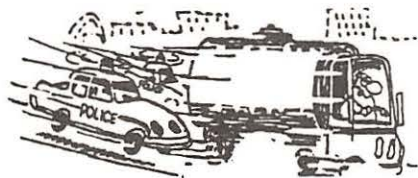
As we headed up to our room I noticed a large crowd of men loitering behind the motel. All were Hispanic, shabbily dressed and they shuffled nervously as if waiting for someone. My scanner chose that time to come alive and started blaring out police calls. The men all looked at me with a panicked expression on their faces. Soon all of them were piling into the backs of pickup trucks and burning rubber to get out of the parking lot. In about thirty seconds what was once a lot filled with 30 or so men was completely empty. And then it hit me what was going on. The men were illegal aliens who had probably just come in from Mexico (the border was only 80 miles away) and were most likely waiting for someone to pick them up, or bring them work. My scanner had frightened them and they must have thought I was either a cop or a Border Patrol agent! No wonder they beat it so fast.

Elwood and I had a good laugh and we settled in for the night. It was hot in Alamogordo and the air conditioning was not functioning so we opened the window. Looking out of the window to admire the New Mexico sunset, I spotted two men sitting in a truck that was facing the highway. Occasionally one of the men would raise a microphone to his mouth and speak into it. I noticed that the truck had what looked like antennas cut to the VHF high band.

A quick search of the VHF police frequencies proved that my suspicions were correct. The two men were undercover cops and were watching the car lot across the street. They were communicating with two other detectives about two blocks away. Suddenly there was movement across

the street and the truck took off. Apparently the undercover sting had netted what they were after. Soon the detectives were hauling away two thieves who were stealing stereos out of the cars in the lot. I said to Elwood, "Who needs television when we have live entertainment all around us!" We both hit the sack wondering what would happen next.

We didn't have to wait long. The hour of 2:00 am seems to be the popular time for waking up sleeping motel guests, for about that time the sounds of sirens interrupted everyone's slumber. Again I looked out our window to see police car after police car, with lights flashing and sirens blaring, racing down the highway that ran in front of the motel. I counted twenty police cars, two ambulances and three fire trucks passing by in less than a minute. By this time I knew enough to turn on the scanner once again to see what the story was.



Again the scanner blared out the drama. Apparently a drunk and angry truck driver was barreling down the highway towards Alamogordo in excess of 100 miles per hour. The New Mexico Highway Patrol had started chasing him when reports of a deranged psycho trucker running people off the road started pouring in. The chase began just outside of Las Cruces (almost 50 miles away) and was heading towards Alamogordo. All attempts to stop the mad trucker had failed. Whenever a police car got close enough to the truck they were run off the road. Something had to be done before the truck reached town.

The Border Patrol came on the frequency and said that they were going to lay a belt of spikes across the highway that would blow out the tires on the truck. They set up the spikes just across from the local Walmart which was about a half a mile from our motel. Leaping out of bed I grabbed my binoculars and went out on the balcony for a better view. The sound of sirens getting louder told me that the chase was coming our way. Police cars came screaming by the motel with their PA systems blaring, warning everyone who might be in the trucker's path to get out of the way. Down the highway, I could see the chase approaching.

The scanner went strangely quiet as the mad trucker hit the spikes. I could hear the tires explode even though I was quite a distance away. Straining to see what was going on, I expected a horrendous wreck but the scanner revealed otherwise. "I can't believe it, he's not stopping!" An incredulous officer exclaimed into his two-way radio.

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Suddenly I saw the reason for all the disbelief that was expressed in the officers voice. The truck flew by the motel at over eighty miles an hour on bare metal rims! Sparks flew from the truck as metal met pavement in angry protest and what little was left of the tires were flying apart in shreds, littering the road with debris. Dodging the debris and in hot pursuit was everyone but the Canadian Mounties.

The police pursuit of the trucker-turned-terminator roared right through Alamogordo. Fortunately the streets were bare at this hour of the morning so the trucker didn't have many targets. In his drunken fury he would have mowed down anyone who stood in his way.

The chase continued for another ten miles and the trucker finally lost control at a curve and flipped his truck just outside of the town of Tularosa. Incredibly, the trucker survived with nary a scratch, but his truck didn't. A propane tank that the trucker was hauling burst and caught fire and destroyed what was left of the rig. The trucker was taken in to custody and probably booked on enough charges to keep him out of a truck for a good long while. In the meantime, I went back to bed, still not believing all I had seen on this trip and hoping that it was all over. As usual, I was wrong.

One Adventure Too Many

The next morning it was time to pack everything up and head back to the relative sanity of home.

Over breakfast at the local McDonalds, Elwood and I discussed all the weirdness that had happened and had a good laugh about it all. On the way back to the motel, we noted the deep ruts in the highway that were evidence of last night's goings on.

When we started packing up, I noticed something was wrong. My prized PRO-2004 was missing! We both searched the room and were soon faced with the fact that we had been burglarized. I had packed the PRO-2004 in a special suitcase that I could take anywhere, sort of a portable monitoring post equipped with built in power supply, antennas, recorder — the works. The whole outfit was very compact and portable, unfortunately *too* portable. Someone had obviously snatched it.

After a quick search we discovered that the only thing that had been taken was the scanner and the case. This perplexed us because we had locked the motel room and hidden the case under the bed. Apparently that is the first place thieves look for valuables, since they ignored a 35 mm camera that was sitting in the bathroom.

We called the local police and reported the loss. Both the police and I surmised that it may have been someone who worked at the motel and they promised they would look into it. Funny though, he wasn't the least bit interested why I carried a scanner in a specially outfitted suitcase.

We were about to hit the road and head home when the weirdest thing happened. We had just packed up the car and were checking the room for anything we forgot when a man walked passed our room — or should I say, staggered past — dragging a large trunk about the size of a coffin. That is exactly what it reminded us of. The man struggled to drag the heavy box down the stairs and load it into the back of his pickup truck. Elwood and I both wondered why the man had requested a room on the second floor if he had such a heavy load to keep with him in the motel room.



After loading his strange load into his truck, the man returned to his room and began hauling a second, similar box down to the truck. This one was a rubberized container that sloshed with something wet inside as he dragged it down the stairs. This was followed by three large green garbage bags full of something wet and sloshy as well. Elwood and I looked at each other disbelievingly and decided it was time to go before we found out what was in the containers.

We ended our trip with the long ride back home, both of us discussing the adventure. Neither of us could figure out what was in those boxes and bags, but we did agree that we really didn't want to know.

MT

Author's Note: Just as this was going to press, the police in Alamogordo recovered my PRO-2004 (minus the case) in a raid on a pawn shop.

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AFGHANISTAN [non] R. Message of Freedom resumed after break, 0145, 0830 and 1400 on 7090v (BBC Monitoring)

ANGUILLA Dr. Gene Scott wanted to activate two 100 kW SW transmitters toward U.S. on July 4, but probably delayed awaiting British frequency assignments (George Thurman, IL, *World of Radio*)

AUSTRALIA Early-morning listeners here to R. Australia are in for a rude awakening on 9580, cricket pre-empting regular fare from 1000 on July 22-26, Aug. 5-9, 19-23 (via Paul Balster, England, W.O.R.) Also from 1500 on 9510; check alternates, though not in English throughout, 5995, 6020, 6080, 9770, 11800, 11855, 13755 (via Jerome van der Linden, South Australia, SW *Echo* via George Thurman)

BOLIVIA R. Galaxia, originally on 5156.2 but lately on 5178.6, is back on 5156.2 (Henrik Klemetz, Colombia, W.O.R.)

BOSNIA R. Bosnia heard on 4498.7 at 2059, weak modulation (Ivonne Eliasson, Sweden, SW *Bulletin*)

BOTSWANA VOA appeared on 7415, 0430-0530 in Portuguese, Hausa, whence? (Ed Rausch, NJ, W.O.R.) Thence, also 1900-2200 (John Vodenik, VOA, SW *Echo* via Thurman) Tough luck, pirates

CANADA Perhaps in response to listener demand, RCI replaced *Open House* with *Quirks & Quarks*, UT Mons. after the 0200 news on 9755, etc. (Bill Westenhaver, PQ; Diane Mauer, WI) Victory of science over religion (gh) In summer it's *Best of...* and offered advance sked showing each week combines items originally on different shows, such as: July 26, poisonous bird, colon cancer gene, big bang, contact lens, asteroid, Mozart killed by medication; Aug. 2, slipped disks, frogs, Tonguska, 24-hour society, romantic love, Babbage engine; Aug. 9, mercury fillings, antibiotic resistance, Perseid meteors (new), cities and environment, electronic tennis judge, computer recycling, supernova, vampire bats; Aug. 16, question show; Aug. 23, halogen lamp hazard, women talk/men listen?, gamma rays, stormy weather linked to strokes, mother smoking gives baby crossed eyes, vitamin E and heart disease, spontaneous human combustion; Aug. 30, Jurassic Park, pieces of Canada found off Spain; Sept. 6, remote viewing; Sept. 13, second-hand smoke, endangered Spix's macaw, lead in dishes, male sea horse pregnancy, medical ignorance; Sept. 20, question show repeat from June 14 (via Diane Mauer) *Sunday Morning* made usual summer cutback to only one new hour, 1311 UT on 17820, 11955, 9625; *Centerpoint* repeats moved to 1405; third hour 1505 occupied by *Word for Word*—latest ideas from non-fiction books (gh)

CANARY ISLANDS R. Nacional de España relays heard on 11430 or 11410 SSB are by the Guardia Civil here, of Radio Uno, Las Palmas, 621 kHz (M. Molano, Madrid, *Play-DX*)

CHINA [& non] CRI relays via Brasília are Spanish 0100-0300 on 17755, 0300-0400 on 15445; via Russia; 1400-1430 Turkish 7305, 1800-1830 Persian 12065, 1830-1930 Arabic 12035, 1930-2000 Portuguese 12065, 2200-2300 English 9880; via France 9845: 1900 Romanian, 1930 Czech, 2000 Polish, 2030 Bulgarian, 2100 Albanian, 2130 Hungarian, Direct in Esperanto: 1100 on 9480, 6955; 1300 on 11650, 8400, 4200; 2000 on 15370, 9965, 7470; 2230 on 11515, 9480. Still a 'siesta' break 0500-0830, no CRI transmissions at all. Nepalese 1500-1600 on 15125, 11445, 9625, 8260, 1269, plus 8450 after 1530 (BBCM)

COLOMBIA MW harmonics audible in next country: La Voz de los Fundadores, Manizales, 6280 at 1200, 3140 at 0100, 4 and 2 x 1570; R. Mil, Cúcuta, 6700 = 5 x 1340 at 1215; R. Majagual, Sincelejo, 2860 = 2 x 1430 at 0030 (Santiago San Gil, Barinas, Venezuela)

COSTA RICA RFPI reactivated 15030 but now on USB, S9 here afternoons (Gaylon Faulk, MO) USB more effective than AM against persistent HCJB spur. New log periodic for 7 MHz may be paired with new 9 MHz frequency at same time. Transmission line finally arrived, and 30 kW transmitter will test low power at first, increase in stages to full power. RFPI will frequently change QSL designs in limited editions; now with 500 new full-color ones. New transmitter has carrier control on AM, kicking back to half power during pauses. RFPI No. 2 now has office in Salmon Arm, BC, Canada; land to be donated; will line-feed programs to CR before their own transmitter is ready (James Latham, RFPI *Mailbags*) Will be 10 kW, local programs and others shared with CR; indigenous voices of that area. Earth-Com plans to create many more RFPIs around the planet (Latham, Radio Japan *Media Roundup*) Such as India, (*Mailbag*) Little change in 3rd-quarter programming, but *Focus on the Americas*, critical of "criminal" Reagan-Bush regime in Latin America, appears at 2300 Mons. and Sats. plus repeats 8 and sometimes 16 hours later (Joe Bernard, RFPI *VISTA*) *World of Radio* remains: Fri. 2000, Sat. 1800, Sun. 2300, Tue. 1900 plus repeats; also on 7375, 7385, 13630, 21465 (gh)

CUBA Arnie Coro spent a few weeks in USA in May, including visit to WFLA Tampa, a non-DX trip, then returned to Cuba (*DX Daily*) Coro is senior advisor to the director of RHC, designed and built their transmitters in the 1960s, and is now frequency manager. Have two 1961 BBCs, much modified, of 100 kW, also a 250 kW Russian, and 75, 50 kW units, some West German, former PTP SSB units, 30 and 20 kW plus another ready to go. The European antennas can take only 100 kW, not 250. Overall schedule reduced by 25% due to oil shortage (interview on RNMN) RHC should be ashamed of its 11760 transmitter, putting out spurious noise well above and below it. 9815-SSB at 0000-0200 sometimes in English, sometimes Spanish (*DX Daily*)

DOMINICAN REPUBLIC Only one SW station is reliable daily, R. Amanecer, 1 kW on 6025, plans increase to 5 kW. R. Norte is sporadic on 4800, but I saw new 1 kW transmitter to be on by Sept. from new site. R. Cima, 4960, heard only once. R. Dominicana should soon have new Japanese 20 kW on 5980. R. Quisqueya, 6205, spasmodic. Inactive are R. Barahona, 4930, and R. Santiago, 9878. R. Olímpica may come on soon as it has a SW license. Most of this SW activity was spurred by the Columbus Quincentenary (Adrian Peterson, visiting D.R. for a week)

ECUADOR HCJB *Today* topics, UT Mons. 0200, 0600, 0700, 0930—Aug. 2, giving birth overseas; Aug. 30, tongue-tied missionaries; also at 0430 Sun. (meaning Mon.?) on 21455-USB. *Morning in the Mountains* includes *World Weather Watch*, actually W. Hemisphere only, weekdays 1245 (*Program Notes*) *DX Partyline* differs vastly depending on who's hosting it. Nominal host Rich McVicar may not be back until Aug. or Sept., having trouble raising support funds; Ken MacHarg went on 6-month furlough in June, leaving John Beck holding the bag. Suddenly, no more jokes and awful puns every few seconds, but long articles read instead (gh)

TWR may be gone from Bonaire on SW, but HCJB has picked up some non-English produced by TWR offices in South America; heard testing already mid-June at 2200-2259 on 11845, joined by 15250 at 2230, from TWR-Brazil (Brian Alexander, PA, W.O.R.) These are scheduled 0730-0930 on 6125, 9515; 2200-2300 on 15355; 2300-2400 on 15375? in Port., 2330-2400 German on 15250, 17490-USB (TWR Germany via Wolfgang Büschel)

La Voz del Upano network observed in last half of May: 3360 Loja,

weekdays 1100-1400 & 2200-0300 relaying 5965, but 3360 silent weekends. 4870 Macuma, weekdays 1100-1400 & 2200-0300 relaying 5020; weekends 1100-1400 relaying 5040. 5020 Macas active but not daily, 5040 Macas is main channel 1100-0300 daily. 5965 Macas weekdays 1100-1400 & 2200-0300, weekends 1100-1400 relaying 5040. 6000 Macas off the air (Yimber H. Gaviria, Colombia, *Play-DX*)

EGYPT R. Cairo settled on 11600 as // to 9475 0200-0330 (V.N. Ostroverkh, Russia, DSWCI, and M. Ogrizek, B. Padula, *ADXN*)

FRANCE RFI plans increase in English from 2-1/2 hours per day now to 6 or 8 by 1995 (R. Netherlands *Media Network*) Média France Intercontinents, pass feed service in French: 0915-0945 daily on 25820, 21730, 21645, 17785, 17775; 1515-1545 except Sun. on 25820, 21685, 17795, 17785 (BBCM)

GREECE VOG at 0000-0350 forced by WEWN 9370 to move from 9375 to 9380 (John Babbis, MD, Steven Cline, IN)

GUAM KTWR new schedule effective June 1, English: 0750-0915 15200, 0855-1000 11805, 1500-1630 (Mon, Tue 1615) on 15610 (via Richard Lemke, Alta., *W.O.R.*)

HUNGARY R. Budapest also new sked from June 1: 0200-0300 on 5970, 9835, 11910, 15220; 2100-2200 on 6110, 7220, 9835, 11910 (via Hans-Peter Tillman, BDXC *Communication*)

INTERNATIONAL WATERS Brother Stair had two 10 kW transmitters and studio installed on ship in late June, but yet to be wired, and awaiting antennas; will take satellite feed via stabilized dish. R. New York International has no connexion with this, but will provide old airchecks for tests (Steve Coletti, *Spectrum*) Stair announced target date for this of Sept. 15, maybe by Labor Day (Diane Mauer, *W.O.R.*)

IRAN VOIRI, Mashhad, on 9640, 6005 at 1430-1630 in Dari, Tajik, Uzbek; after 1630 carries Tehran news. Pashto at 1430-1530 on 11930 is from Zahedan; Azeri at 1230-1300 on 11895 from Tehran or Tabriz (BBCM) You mean studios, transmitters, or both?

IRAQ RII operations vary day to day; new 15179.94 at 2205-0300 with English 2331-2345, 0230-0245, strong but distorted, better on // 17940; but next day heard on 13679.93 only at 1945-2125* with English 2043-2056; 2140-2155* back on 11810 ex-11805; *2200 on 11810 but not // 17940 which had English news 2217-2220; then the two swapped programs, English on 11810; 2315 check, 11810 in English; 2354 17940 // 15179.94 English (Brian Alexander, PA, *W.O.R.*) Very irregular; one day 2000-2100 English, 2100-2155 Arabic on 11810 & 13680, both jammed by Sa'udi Arabia; both later observed with English 2043-2058, 2230-2254, 2310-2349 (Wolfgang Büschel, Germany) Had mailbag from U.S. on a Tue. at 2050-2110, 13680 heavily jammed (Tom Sundstrom, NJ, *SW Echo* via Thurman) 15180 totally blocked here, but 17940 peaks around 0130-0300, with English varying 0230-0245 (Craig Jordan, Sacramento, CA)

[non] V. of Rebellious Iraq, Anti-Saddam, from P.O. Box 1959, Tehran 14155, Iran, was on 7090 at 1600-1800; subsequently 7060v at 1530-1800, also 0300-0500, 1200-1300 in Arabic, Kurdish. Same organization prepares programs for V. of the Islamic Revolution in Iraq, 9670, 7215 and 1224 kHz at 1330-1530 in Arabic (BBCM)

JAPAN R. Japan is relaying domestic service: 1000-1300 on 11815, 9750; 1300-1400 on 11865, 11815, 11735-Canada, 9750, 9535-Shri Lanka; 2200-2230 on 17810, 7140 (BBCM) Last one is until 2300 (Bill Westenhaver, PQ, *SPEEDX*) On May 25, RJ adopted new version of ID signal *Kazoe Uta*, synthesizer replacing celeste, which was too high-pitched for SW (R. Japan *Media Roundup*) News item on RJ says a report calls for adoption of DST to save energy, adding one or even two hours to UT+9 (gh)

KASHMIR R. Kashmir had originated from New Delhi for three years for safety of staff, but now returning to Srinagar. Doordarshan director was assassinated in 1990 (*The News*, Islamabad, BBCM) Resumed Srinagar news operation will bring major changes in tone,

tenor, content and presentation, more Urdu words. Tough tone would become conciliatory; word for terrorist replaced by warrior (PTI news agency, Delhi, BBCM)

LITHUANIA R. Vilnius' existence is at stake; we do not know how much longer we will be able to go on the air. This has a very demoralising effect on the staff; favourite shows have disappeared without explanation (R. Vilnius *Letterbox* via BBCM) The 2300 broadcast moved to 12040 (BBCM, Dave Jeffery, Robert E. Thomas)

MALI RTM, Bamako: Weekdays 0555-0800 on 5995, 4835, 4783; 0800-1000 on 11960, 9635, 7285; Sundays from 0700; daily 1155-1755 11960 9635, 7285; 1755-2400 on 5995, 4835, 4783. French, many Afro languages; English news magazine irregularly Suns. 1845-1900 (BBCM)

MOROCCO First two of ten new VOA transmitters began June 23 replacing Greenville on 15410 at 1600-2200 in English, 17785 at 1600-2200 in English and others (Dan Ferguson, VOA, USENET via Thurman) Beamed 148 and 184 degrees respectively (VOA *Communications World*) A major setback for domestic listeners of VOA (gh)

NETHERLANDS RN will originate programs from Friesland the week of August 9; Wed. documentary Aug. 18 looks at unusual classified ads. *Sounds Interesting*, Sat. Sept. 4, explores Europe's mail system (via D. Mauer, F. Orcutt, G. Lytle, W. Martin)

NEW ZEALAND Ian Johnstone, manager of RNZI for 3-1/2 years, has left (Steven Cline, IN) Likely leading to programming changes (Rudi Hill, RNZI via Gigi Lytle, TX) Long-lived Kiwi Radio, pirate in Hastings, operates very openly, Sats. & Suns. around 0700 on new 7445; NZ has no radio inspectors (Arthur Cushen, NZ, *RNMN*)

PARAGUAY ZP-30, R. La Voz del Chaco on 610, is adding SW around 4.9 MHz with 5-10 kW converted MW transmitter to serve Mennonites in Eastern part of country, by July or August, including simulcast of English UT Mondays (Frank Kröcker, ZP-30 on *DXPL*)

PERU R. La Merced at 1030 still announcing 4960 but on 4964.5; R. Ritmo presumed still the ID of Puerto Maldonado reactivated on 5602.7 at 0130, weaker than before (Henrik Klemetz, Colombia, *W.O.R.*) R. Chilía, 3500.5 at 0000-0025; R. Naylán, Lambayeque, 4299.8 at 0310-0401 and 0940-1000 (Pedro F. Arrunátegui, Lima, *El Chasqui DX* via *Play-DX*)

ROMANIA RRI recommends these programs on the 1900, 2100 and next UT day 0200 broadcasts: Sun., *Sunday Studio* (*Letterbox*, interviews, *Romanian by Radio*, *Philatelic Agenda*). Mon., *Past & Present*, *Romanian Itineraries*, *Romanian Hits*, *Radio Ham program*, *Sports Round Up*. Tue., *Youth Club*. Wed., *Women—the other force*, *Friendship & Cooperation*, *Romanian Musicians*. Thu., *Letterbox*, *Skylark*—folk music. Fri., *Cultural Survey*. Sat., *Romanian Literature*, *DX Mailbag*, *Through Bucharest along the Centuries* or *Romanian Folkmusic at its Best*. The 0400-0430 show; (local days): Sun., *Sunday Essay*, *Radio Pictures*. Mon., *History Past & Present*. Tue., *Current Affairs*. Wed., *Investments in Romania*. Thu., *Current Affairs*. Fri., *Romanian by Radio*. Sat., *RRI Encyclopedia* or *Through Bucharest along the Centuries* (via Chuck Wharton, TX)

RUSSIA R. Moscow's Nepali service resumed after 2-year break,

DX Listening Digest

— Much more info in the style of Hauser's column.

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Glenn Hauser, Box 1684-MT, Enid, OK 73702

1245-1300 on 21585, 17755, 15590, 15510 (BBCM) TWR began relays via R. Moscow, Irkutsk, 250 kW to S. Asia from June 1, no English (TWR HQ news release) no frequency mentioned either, who cares? (gh) 1230-1500 on 11655, 0030-0200 on 11675 (*Bonaire Wavelengths*) No, 1230-1430 and 0030-0200 on 11675 only (RNMN) FEBC via Russia in Chinese had been on 6035, now on 6005 and 1224 at 1130-1500, maybe same transmitter as ex-DVR on 9560 (Ts. Kito & Y. Kato, RJMR) Novaya Volna-2, new independent station from Chelyabinsk, 0700-1100 on 5 kW 5450; QSL and pennant from Ul. Vorovskovo 6, Chelyabinsk-91 454091 (Grigory Grigoriev, Russia, BDXC *Communication*) U Radio, Moscow, founded by Student Trade Union Organizations, Tue.-Fri. 1600-2000 on 5900; addr. is Musical Centre, Moscow State Univ., Vorobiovy Gory, 118234 Moscow (Arūnas Silickas, Lithuania)

RWANDA DW's new English to Africa at 2100-2150 booms in on 15135 from here, also announcing 9640, 15350 (gh, OK) [non?] R. Muhabura, claiming to be in the Ruhengeri region of Rwanda, clandestine of Rwandan Patriotic Front, 0330-0505, 1000-1135 on 6340, 1715-2005 on 6400 in Kinyarwanda, but also French 1815, English 1900, Swahili 1915. Hours may be extended on Sundays (BBCM)

SA'UDI ARABIA Holy Koran service for J93: 0600-0800 21495, 15240; 0800-1000 21665, 21495; 1800-2100 7250; 1900-2100 11935. Call of Islam 1500-1700 21505, 11950. Network 2 0300-1700 9580, 1700-2100 6020 (BSKSA via Bob Padula)

SERBIA R. Yugoslavia, Radio of the Serbian republic of Bosnia-Herzegovina, in Serbian, 2025-2030 on 9720, 6100; 0025-0030 on 9580 (BBCM)

SLOVAKIA AWR's German service *Stimme der Hoffnung* from Darmstadt will rent time on 250 kW SW here at low cost, feeder also to Russia SW relay to avoid tape shipment problems (Arno Patzke, AWR, *Funk* via Büschel)

SOMALIA The R. Mogadishu destroyed by UN forces in early June was the one on 962 kHz MW backing Gen. Aydid, not traced since June 11; Ali Mahdi Muhammad's R. Mogadishu, not in a dispute with the UN, continues around 0445, 1045 or 1100, and 1700 on 6822 or 6722 kHz, USB plus carrier. UN station, R. Manta, 45 mins. at 0415, 1000, 1100, 1300 on 9540, and 1600, 1700, 1900 on 6170. An anti-UNOSOM station called V. of the Somali masses clashed on 9540 with virulent attacks on UNOSOM, USA, around 1100, both on USB + carrier; VOSM would go on and off to listen to what Manta was saying, then contradict it (BBCM)

SOUTH AFRICA SABC all-night service R. Orion, closed May 31, partly due to negotiations with the American film company regarding use of the name Orion. Peter Human, manager says it's end of an era for all-night radio, but beginning of a new, continuous service for targeted and formatted radio (R. South Africa via BBCM) So is something else on 3320? (gh) The New Capital Radio, Transkei adopted new black format July 1, "station with an Afritude," best African and international hits 24 hours on FM from P.O. Box 604, Durban 4000; two 10 kW SW off 7150, 3930 for maintenance, at least in June (David Smith, RNMN)

UKOGBANI *Arabian Sounds*—classical, folk and religious music is on BBC through August, Mons. 0145, Tues. 1445, Fris. 0415 (BBC *Worldwide*)

UKRAINE R. Nezalezhnist (Independence) is reported on 11825 at 1400-1600 Mon., Tue., Thu., Sun. (Nikolai Rudnev, Russia, *OzDX*) RUI retimed English to 1600-1730 on 12055, 15130, 15570 (Arthur Cushen, RNZI *Mailbox*)

USA The Clinton Administration has decided to merge VOA and Radio Free Europe/Radio Liberty under the same governing board. Some services would close down and broadcasts to the former Yugoslavia, Ukraine and Russia would be coordinated. Radio Martí and

Radio Free Asia, yet to be established, would also be under the new board. Greatest savings will come from combining transmission, engineering and administrative operations (David Binder, *NY Times*, via David Cole) If approved by Congress, merger could reduce budget by as much as \$150 million annually (R. Jeffrey Smith, *Washington Post*, via Chet Copeland) Consolidation expected to save \$250 million over next four years (Andrew Borowiec, *Washington Times*, via Cole) One proposal is for RFE to end broadcasts to Poland, Hungary, Baltics, Czechia and Slovakia, no longer needing surrogates (Daniel Williams, *Washington Post*, via Copeland) RFE is set to announce termination of all but Bulgarian and Romanian; some VOA broadcasts to former Soviet Union will be terminated, while those of RL will continue. Altogether about 600 employees at RFE and 600 at VOA will be affected (*NY Times*, via Scott Edwards) See also Morocco; this is bound to increase excess transmitter capacity, especially within the USA—what to do with it? A golden opportunity to finally get National Public Radio on SW, and to relay overseas stations still poorly heard in the USA! (gh) (this story also via Don Thornton, Bill Westenhaver) R. Free Serbia, breaking near-monopoly of media by Milosevic, approved by Administration for launching on RFE by end of summer (Los Angeles *Times*, via Boston *Globe* via Malcolm Kaufman)

Battle between anti-Castro hard-liners and liberals has settled in with a vengeance at the Office of Cuba Broadcasting, exacerbated by the change in U.S. administration and the belief that the situation in Cuba is moving toward change. Dissension and bitterness reign. Morale of the 140-member staff is at rock bottom. Skirmishes are frequent, over everything from news content to musical selections. The struggle, top official concede, is threatening Radio Martí's legal mandate to provide Cubans with a balanced news report at a critical time for island listeners (Christopher Marquis, *Miami Herald*, via David Rutman; and *Tampa Tribune* via Rusty Serenberg)

WRMI experienced delay after delay, but hoped to be on 9955 by August. Already via WRNO, a new English program is *Caribbean Pick Hits*, Suns. 2300-2330 on 7355, just before *Miami en Vivo*, hosted by Tony Bourne, from Trinidad, with listener contests (Jeff White, WRMI)

WEWN was running four different program feeds on satellite, when only three SW transmitters were active, approx. 5.6, 5.7, 5.8 and 5.9 MHz on Galaxy 1, transponder 11 (George Thurman, IL. *W.O.R.*)

WHRI switched from phone lines to satellite feeds from South Bend to Noblesville, Galaxy 6, channel 15, 7.37 MHz subcarrier for South American service, 7.46 for Europe, and testing 7.55 for feed to KWHI Hawaii (Joe Hill, WHRI, *W.O.R.*) That puts *World of Radio* back on a bird without really trying, so available that way to satellite listeners, and to additional stations, but Croatians expanded bumping *W.O.R.* on WHRI to UT Sat. 0600 on 7315, 9495, added Sun. 0130 on 7315, still Mon. 0300 on 7315 (gh) Galaxy 6 @ 99°W (*Media Scan*) Narrowband audio (Gerard Foley, OH) When on 7315 and 7355 at 0900, WHRI puts strong mix spur on 7275, weaker one on 7395 (Bill Westenhaver, PQ) Four new *W.O.R.* outlets in NE Colorado, all 7:05 pm MDT Sats.—KSIR AM 1010, FM 107.1 in Brush; KRZD AM 1440, KATR FM 98.3 in Wray.

World of Radio on WWCR: 15685, Fri. 2215, Sun. 2300, Mon. 1230, Tue. 1130; 7435, UT Sun. 0305. *Full Disclosure* editor Glenn Roberts has talk show of same name on Let's Talk Radio, now added to WWCR schedule, UT Mons. 0000-0100 on 7435 (Duff Preston, MI, *W.O.R.*) New on WWCR 7435 from Aug. 1 is *Tireless Voyager*, talk show with Bruce Holms, UT Mons. 0200-0300 (Joe Brashier, WWCR)

VANUATU R. Vanuatu, 7259.95, heard from 0625, French news 0630, English at 0700 but usually closes this frequency just as it starts; on one occasion it stayed on with the news past 0707 (Kevin Murray, OR, *SPEEDX*)

VENEZUELA R. Occidental, Santa Rita, on 3160 = 2 x 1580 at 2330, Mexican music (Santiago San Gil, Barinas, Venezuela) *Until the next, best of DX and 73 de Glenn!*

Broadcast Loggings

Thanks to our contributors — Have you sent in YOUR logs?
Send to **Gayle Van Horn**, c/o *Monitoring Times*.
English broadcast unless otherwise noted.

0005 UTC on 15345

ARGENTINA: RAE. Station ID with promotional and frequency quote. National newscast to featured music program of easy-listening ballads and Argentine tangos. (David Harrison, Crestview, FL)

0020 UTC on 9530

SPAIN: Spanish Natl Radio. Commentary on Basque party, Spain's economic stability. *Daily Press* reviews. ID, political commentary to newscast at 0100. (Billy Newberry, Bakersfield, CA)

0025 UTC on 6165

NETHERLANDS: Radio Netherlands. Canned ID and greetings on parallel 6020 kHz. International news topics from North Korea, United Nations, Somalia, Nigeria, and Bosnia. (Newberry, CA)

0050 UTC on 9745

ECUADOR: HCJB. Political news on Peru's president. *Travel to Latin America* featuring Galapagos Islands' unique wildlife and park system. Kudos to host MacHarg! HCJB on 17890 kHz at 1230 with religious program and IDs. (Harrison, FL)

0058 UTC on 9830

CROATIA: Croatian Radio. Croatian. Easy-listening music to ID as "Hraski Radio." Newscast on parallel frequency 13830 kHz. (Harrison, FL)

0105 UTC on 21740

AUSTRALIA: Radio Australia. International news topics to 0112. UTC time check and upcoming program preview. (Harrison, FL) Station monitored on 17840 kHz at 0500. (Ed Rausch, Cedar Grove, NJ) Station's *Music at Your Request* audible on 9580 kHz at 1030. (Bob Fraser, Cohasset, MA)

0125 UTC on 3380

GUATEMALA: Radio Chortis. Spanish. Nice to hear this station amid the summer tropical band static. Easy-listening instrumentals. "Chortis" ID with frequency quote and canned station promo at 0126. Latin vocals and evening announcer's news. Fair signal quality. (Frank Hillton, Charleston, SC)

0230 UTC on 17940

IRAQ: Radio Iraq Intl. Various news topics and anti-west propaganda items. Signal was excellent and programming quite interesting! (Alan R. MacNabb, Santee, CA) *Good luck on the QSL!* (GVH)

0230 UTC on 4800

GUATEMALA: Radio Buenas Nuevas. Spanish. Religious text into Spanish ballads. Local time check and continued text. Radio Tezulutlan booming on 4835 kHz at 0238. Local news, jingle with phone number. Traditional marimba tunes to canned ID and station promotional. (Hillton, SC)

0235 UTC on 9835

HUNGARY: Radio Budapest. Features: Budapest stock exchange and Hungary's health care program with interviews and discussion. (John R. Shelby, Boise, ID)

0300 UTC on 15380

SINGAPORE: BBC Relay. Interval signal to ID and international news. BBC Relay station Ascension Islands, heard on 21660 kHz at 1500, with *Jolly Good Show*. (Rausch, NJ) BBC's Seychelles relay heard on 15420 kHz, 0330-0400 with *This Week in Africa*. (Urbelis, NY)

0325 UTC on 4865

COLOMBIA: La Voz del Cinaruco. Spanish. Headlines at tune-in. ID jingle. Canned promotional to Latin pops and "Caracol" ID. Local time check at half-hour into extended news. (Brian Bagwell, St. Louis, MO)

0340 UTC on 4919.9

ECUADOR: Radio Quito. Spanish. Regional news topics. Canned ID with "la voz de la capital" promo and frequency quote. Quito time check to lovely piano instrumentals. (Jerry Wilkins, Denver, CO)

0350 UTC on 5131

PERU: Radio Vision. Spanish. Lovely Andean music with Peruvian renditions of U.S. western tunes. Station ID at 0402 into standard ballads. Other Peruvians logged; Radio Ilucan on 5620.4 kHz at 0415. Announcer's commentary to music bridge and two clear IDs at 0410 and 0431. Radio Cobriza 2000 on 4925 kHz at 1150. Lady DJ's Andean vocals to Peruvian harps. 1200 ID and local news to 1210. (Jerry Witham, Keaau, HI)

0355 UTC on 6105

TANZANIA: Radio Tanzania. Swahili. African music to commercials. Native drums and ID at 0400. African news topics to ID repeat and lengthy commentary. (Witham, HI)

0630 UTC on 17440

KIRIBATI: Radio Kiribati. Kiribati. Closing items on local island news from lady announcer. Clear station ID in English followed by BBC program relay. Fair signal quality, slight QRM. (Wilkins, CO)

0800 UTC on 9280

TAIWAN: Voice of Asia. Chinese. Pop Asian tunes in Chinese. Program news to announcer chat and IDs. (Errol Urbelis, Kings Park, NY)

0815 UTC on 9645

BRAZIL: Radio Bandeirantes. Portuguese. Brazilian pop tunes to clear ID, local ads, and talk. (Urbelis, NY)

0855 UTC on 11650

NORTHERN MARIANAS ISLANDS: KFBS-Saipan. IS/ID in English/Russian. Children's choir, religious programming. (Rausch, NJ)

1030 UTC on 9545

SOLOMON ISLANDS: SIBC. Local news items heard on parallel 5020 (weaker). Island tunes to Radio Australia news relay at 1100. Programming audible to 1105. (Hillton, SC)

1045 UTC 3994.9

INDONESIA: RRI-Pontianak. Indonesian. Ethnic music and prayers at 1045. Indo music and commercial type breaks. Several mentions of Bali and Indonesia. Indo's RRI-Serui heard on 7173.2 at 1615. Nice soothing music and vocals in Indonesian. (Witham, HI)

1120 UTC on 2325

AUSTRALIA: VL8T Tennant Creek. Local programming and easy-listening music. Aussie VL8A Alice Springs heard this time on 2310 kHz. Great 50's music vocals, and regional news. (Hillton, SC)

1200 UTC on 15220

NETHERLANDS ANTILLES: BBC Antigua relay. World Service program and IDs to *Play of the Week* featuring "Phoenix". (Fraser, MA)

1230 UTC on 15400

FINLAND: Radio Finland. Great signal for IDs, international news and *Compass North* program. (Walter Marksfield, Peoria, IL)

1330 UTC on 15295

UZBEKISTAN: Radio Tashkent. Station ID and commentary. Frequency schedule noted at 1200-1225, 1330-1355, & 0100 on the following frequencies; 17815/15295/9715/7285 kHz. (MacNabe, CA)

1400 UTC on 15770

ICELAND: Icelandic Natl Service. Icelandic. National news, weather, local information. (Urbelis, NY) Station audible on 11401 kHz at 2300. IS and English/Icelandic ID. News and commentary to 2333*. (Rausch, NJ)

1610 UTC on 7173.2

PAKISTAN: (Clandestine) Voice of Independent Kashmir. Regional instrumental music to 1615. Long discourse by announcer's unid language. Prayers and anthem to 1630*. (Witham, HI)

1630 UTC on 17620

FRANCE: Radio France Intl. *Paris Calling Africa* program with report on human rights of indigenous peoples. (Fraser, MA) RFI audible on 17575 kHz at 1245. (Wright, MS) (Marksfield, IL)

1645 UTC on 6962

NORTH KOREA: (Clandestine) Voice of National Salvation. Korean. Male announcer's long text to music and lady announcer at 1659. Korean anthem to 1700*. (Witham, HI)

1650 UTC on 6822

RUSSIA: Radio Moscow Intl. Station feeder on USB. Unknown language to Turkish style music. News and station ID at 1700. (Witham, HI) Station audible on 11790 kHz at 0015. National news and IDs heard on parallels 11750/17655/11840 kHz. (Sam Wright, Biloxi, MS) *News in Brief* heard on 17675 kHz/17735 (fair-poor) at 1130. (GVH)

1657 UTC on 4760

INDIA: All India Radio. Traditional Indian music at tune-in. Station ID to 1700*. (Witham, HI)

1700 UTC on 15240

AZERBAIJAN: Radio Azerbaijan. Interval signal to station ID. Regional news to music of local opera singer. (Rausch, NJ)

1700 UTC on 9418

PAKISTAN: Radio Pakistan. English news and commentary. Pakistani music to Holy Koran readings at 1715. Poor to fair. (Urbelis, NY)

1820 UTC on 8260

CHINA: China Radio Intl. Station feeder on USB in Chinese. Numerous references to Beijing. 1830* with music box IS and station ID. (Witham, HI) *Listener's Letterbox* on 15210 kHz at 1240 featuring space program. (Fraser, MA)

1925 UTC on 17575

ISRAEL: Kol Israel. *DX Corner* show with report on Sangean ATS-606P taken from the pages of *Monitoring Times*. Also on 15640 kHz at 1920 with *Calling All Listeners*. (Fraser, MA)

2015 UTC on 15350

LUXEMBOURG: Radio Luxembourg. German. DJ program format of news, U.S. oldies and British pops. (Urbelis, NY)

2045 UTC on 17760

CUBA: Radio Havana Cuba. French. DJ presents Cuban music show. Commentary on South African apartheid to English service at 2100. (Fraser, MA) (Hillton, SC) (Wright, MS)

2045 UTC on 15330

BULGARIA: Radio Bulgaria. 'Time Out for Music' featuring a Bulgarian children's choir. (Fraser, MA) National news to music bridge and national folk tunes on 11720 (best)/15330 (fair) at 0040. (Wright, MS)

2315 UTC on 4765

CONGO: RTV Congolaise. French. News to afro reggae vocals. Station ID to national anthem and 2358*. (Rausch, NJ)

Utility World

Larry Van Horn

c/o MT, P.O. Box 98
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Major World Air Routes

Monitoring aircraft communications is one of my favorite things to do, as those who read this column regularly or who have attended an MT convention already know.

No doubt many of you have a scanner that covers civilian and military aero frequencies. MT's Plane Talk and Federal File columns both cover these chunks of radio territory. The civilian aero band runs from 108 - 136 MHz and the military operates in the 225 - 400 MHz range. Aircraft and ground stations alike in these VHF/UHF ranges use AM mode (Amplitude Modulation).

You will hear the full gamut of communications in the VHF/UHF aero bands: air traffic control, company frequencies, emergency comms, etc. But did you know that shortwave radio offers the same menu for listeners so equipped?

Instead of monitoring flights within line of sight of your scanner, on HF you will hear international flights from all over the world—military and civilian. You will be able to hear high flying aircraft from all five continents as they travel the world's airways. All these adventures and more await you as an aeronautical communications monitor.

This month, I want to take you on such a journey within one sector of this aeronautical frequency spectrum—the MWARAs or Major World Air Route Areas.

For the purpose of air traffic control communications, the world has been divided into specific regions. These MWARA frequencies have the same use as the Air Traffic Control frequencies on your scanner radio. Following are the primary MWARAs and the abbreviations used in official and hobby publications to identify them.

Region	Designator	Region	Designator
Africa	AFI	North Atlantic	NAT
Caribbean	CAR	North Central Asia	NCA
Central East Pacific	CEP	North Pacific	NP
Central West Pacific	CWP	South America	SAM
East Asia	EA	South Atlantic	SAT
Europe	EUR	South East Asia	SEA
Indian Ocean	INO	South Pacific	SP
Middle East	MID		

Because of the vast areas mentioned in the above list, several of the MWARAs have been further subdivided into smaller segments. For example, the North Atlantic MWARA is divided into six separate segments: NAT-A through NAT-F. Each segment has its own assigned air space, frequencies, and ground stations associated with it. Sometimes a particular ground station, such as Gander, New York, etc. in the NAT family will be found on more than one segment, depending on its location.

These MWARA frequencies are used to keep commercial and military aircraft on conflict-free, fuel efficient routes during their flights. All aircraft flying in international airspace fly established routes (airways) with waypoint reporting positions. Waypoints are sometimes designated by a five-letter name or by geographic coordinates of latitude and longitude. As these aircraft pass each waypoint on its route, it reports its current position to a ground station that has the "guard" for that aircraft. Usually, estimates for the next two or three waypoints as well as flight level, wind direction/speed, outside air temperature and fuel consumption are given.

Table 1 contains the latest MWARA list of families/segments and their frequencies for those listeners who want to monitor specific

MWARAs. Be sure to keep propagation in mind when picking frequencies to park on—higher frequencies in the daytime and lower at night. Also remember that propagation affects communications in a particular MWARA or segment. Depending on the time of day at a particular MWARA, the frequencies that propagate to you may not be those in current use. Experiment with listening to specific frequencies for given areas and you will soon be able to develop some specific listening plans. Check out a few of the frequencies in Table 1 and let us know your findings via the logging section. I hope to hear from you soon.

Intercept of the Month!

Longtime reporter Bill Fernandez up in Massachusetts checks in this month with several intercepts of U.S. Navy transmissions in the marine bands. In a two hour period, he monitored several ships with four letter IDs (using only the first letter) discussing the current exercise and waiting for the last aircraft to land on a carrier. These ships were tracking each other and other aircraft in the exercise.

Bill said that comms about the radar tracks eventually slacked off and became informal with lots of personal stuff passed between several station operators. Some of this included first names, home telephone numbers, addresses and dates, etc., while occasionally passing radar information back and forth. One exchange was relating how one ship's aircraft got near another ship (the enemy) without them knowing it, and the surprised comms from the bridge (captain) that ensued!

"This was a VERY interesting two hours of listening, to say the least," Bill said. He advises other listeners to use the same technique to listen to what is really going on. "After hearing exercise activity on FACSAC frequencies, go looking for these 'behind the scenes' comms."

Bill says if something is going on on a FACSAC frequency, you can bet participants are talking about it on what appears to be a prearranged discrete frequency. For example, this one on 8297 was in the middle of a ship/shore telephone band. Bill says they appear never to use the same frequency twice, so it takes some searching to find, but once discovered, you will be treated to a lot of interesting listening.

As a postscript to the above story, Bill said that these ships were just coming into Norfolk, VA, when comms stopped for the night. I would like to thank Bill Fernandez for the interesting information on monitoring these discrete Navy frequencies.

Talking about the Big One...

David Howden, the Fisherman, has passed on some interesting fishing frequencies via our Grove BBS. David says, "I'm not sure if you or anyone else is a fisherman but if you want to hear stories about the big one that didn't get away, check out the following frequencies, all in USB": 3313.5 4441.0 4520.0 5215.0

David says these are frequencies used by "north of sixty" fishing camps for phone patches to LaRonge, Canada. People in the camps may "call the office" and are used for comms between the other camps in the Northwest Territories. 3313.5 is the frequency used for the portable radios for people who want to fly to outcamps to fish (up to 100 miles away from main camps).

At 0300 UTC, people check in on 3313.5 using 25 watt single channel radios. The main radios at the fishing lodge on Lake Obre are 150 watt units and all antennas are dipoles. The camp is located at 61 degrees

Table 1
Major World Air Route Areas (MWARA)

North Atlantic (NAT-A): 3016 5598 8906 13306 17946
North Atlantic (NAT-B): 2899 5616 8864 13291 17946
North Atlantic (NAT-C): 2862 5649 8879 13306 17946
North Atlantic (NAT-D): 2971 4675 8891 11279 13291 17946
North Atlantic (NAT-E): 2962 6628 8825 11309 13354
North Atlantic (NAT-F): 3476 6622 8831 13291
Western Caribbean (CAR-A): 2887 5550 6577 8918 11396 13297 17907
East Caribbean/Atlantic (CAR-B): 3455 5520 6586 8846 11330 17907
Africa & South Atlantic (AFI-1/SAT-1): 3452 6535 8861 13357 17955
South Atlantic (SAT-2): 2854 5565 11291 13315 17955
Northeast/Southeast/Central
South America (NE-SE-C SAM/SAM-2): 3479 5526 8855 10096 13297 17907
Northwest/Southwest
South America (NW-SW SAM/SAM-1): 2944 4669 6549 10024 11360 17907
Europe (EUR-A): 3479 5661 6598 10084 13288 17961
Middle East (MID-1): 2992 4669 6631 8951 11375 17961
Africa/Middle East (AFI-3/MID-2): 3467 5658 10018 11300 13288 17961
Middle East (MID-3): 2944 4669 6631 8951 11375 17961
Africa (AFI-2): 3419 5652 8894 13273 17961
Africa (AFI-4): 2878 5493 8903 13294 17961
Africa/Indian Ocean (AFI-5/INO-1): 3476 5634 8879 13306 17961
Southeast Asia (SEA-1/SEA-3): 3470 6556 10066 11396 13318 17907
Southeast Asia/East Asia (SEA-2/EA-2): 3485 5649 5655 8942 11396 13309 17907
East Asia (EA-1): 3016 6571 8897 10042 17958
North Central Asia (NCA-1): 3019 5646 13315 17958
North Central Asia (NCA-2): 2851 4678 6592 10096 17958
North Central Asia (NCA-3): 3004 5664 10039 13303 17958
Central West Pacific (CWP-1 & 2): 2998 4666 6532 6562 8903 11384 13300 17904 21985
North Pacific (NP): 5667 6665 8915 13339 17946 21925 2932 5628 8951 10048 13273 17904
Central East Pacific (CEP-1 & 2): 2869 3413 5547 5574 8843 11282 13288 13354 17904

05 minutes North and 101 degrees 42 minutes West.

Many thanks to David for passing on these frequencies for our Ute World readers.

NAVTEX for Capetown Radio

Regular reporter Robert Hall in South Africa passes along the following tip. "I have just picked up a SITOR-B transmission announcing that test transmissions of the NAVTEX service began last month on July 9, 1993, at 0700 UTC and will continue on following Fridays at the same time."

NAVTEX is part of the Maritime Safety Information service (MSI) which is itself part of the Global Maritime Distress and Safety System (GMDSS). NAVTEX is transmitted in the SITOR-B mode on 518.0 kHz up to a range of around 400 miles. By international agreement, all ships of 300 gross tons or more must be equipped with NAVTEX receivers by the first of this month. These receivers automatically print out all the latest weather information gleaned from various satellite and terrestrial collecting systems. There are 81 listed coastal NAVTEX transmitters in operation around the world at this time. Capetown will be number 82.

Table 2

Location	Latitude	Longitude	Main Day Freq	Speed/Shift
Dakar	14°34'N	17°29'W	19749.6 LSB	50/730
Nairobi	1°17'W	36°48'E	17442.0/13737.0	100/850
Pretoria	25°44'S	28°12'E	18242.0/13542.0	75/425
Cairo	30° 1'N	31°14'E	18254.0/18108.0	75/850
Jeddah	21°29'N	39°10'E	23370.0/17590.0	100/850

Station indexes and location indicators for the stations mentioned above:

Location	Station Index	Location Indicators
Dakar	61641	GOOO/GOOY
Nairobi	63740/63741	HKNA/HKNC
Pretoria	68262/68263	FAPR
Cairo	62366/62371	HECA
Jeddah	41024	OEJN

African Meteo Stations

Robert also passes along the information in Table 2 for those interested in receiving synoptic RTTY weather forecast/observations from the African continent.

The frequencies mentioned in Table 2 are center frequencies as published in the *Klingenfuss* and *Confidential Frequency List* directories. Actual frequencies may vary, and depending upon your receiver and decoder, RTTY or LSB mode selections on your receiver may provide better reception.

Lower frequencies than those indicated for each station are available but seldom provide good signals. Again, refer to *Klingenfuss*, the *Confidential Frequency List*, or the soon-to-released 8th edition *Grove Shortwave Directory* for lower alternatives.

Nairobi has very recently been designated a Regional Meteo Center and is now linked into Offenbach and Bracknell meteo centers. Like Dakar and Pretoria, RTTY and Fax transmissions are made on USB and LSB on the same frequency but the two can be difficult to separate. Try tuning up and down and around.

The entire African continent is covered through transmissions from three locations: Dakar covers central and northwest Africa, Nairobi covers center and northeast, and Pretoria covers all the south up to the equator. Transmissions from Cairo and Jeddah add coverage from the Middle East.

Many thanks to Robert Hall for providing that information. We both hope you can start getting some interesting weather information off the African continent courtesy of his report.

Well, that about wraps it up for this month's column. I would like to remind you all with computer modems that you can reach me on the Grove BBS. The system is available Monday-Friday from 6:30 pm - 8 am Eastern Time and 24 hours a day on weekends at the following numbers.

704-837-9200 300/1200/2400 BPS
704-837-7081 9600/12,000/14,400 BPS
704-837-5957 300/1200/2400 BPS

You can upload your logs on the board or drop off your content contributions on the board just like David Howden did this month. We have a special message conference setup for this column on the board, and I encourage you to check in often. Now it's time to see what's happening this month in the world of utilities DX.

MT

Utility Loggings

Abbreviations used in this column

AFB	Air Force Base	NG	National Guard
AM	Amplitude Modulation	Nuko	New Codes'
CG	Coast Guard	Ops	Operations
Comms	Communications	QRM	Interference
COMSTA	Communications Station	QSY	Change frequency
CV	Aircraft Carrier	RAF	Royal Air Force (UK)
CW	Continuous Wave (Morse Code)	RCC	Rescue Coordination Center
EAM	Emergency Action Message	SELCAL	Selective Calling
FAA	Federal Aviation Administration	SITOR-A	Simplex teleprinting over radio, mode A
FACSFAC	USN Fleet Area Control & Surveillance Facility	SLHFB	Single Letter HF Beacon
FAF	French Air Force	STRATCOM	Strategic Command
Fax	Facsimile	Tac	Tactical
FEMA	Federal Emergency Management Agency	UK	United Kingdom
HF	High Frequency	Unid	Unidentified
ID	Identification	UNPROFOR	United Nations Protection Force
LSB	Lower Side Band	US	United States
MARS	Military Affiliate Radio System	USCG	United States Coast Guard
Meteo	Meteorology	USN	United States Navy
MFA	Ministry of Foreign Affairs	USNG	United States National Guard
m/v	Motor Vessel	USS	United States Ship
NASA	National Aeronautics & Space Administration	VOA	Voice of America

All frequencies in kilohertz (kHz), all times in UTC. All voice transmissions in English unless otherwise noted.

- 2182.0 PBK-Netherlands CG announcing navigation warning broadcast at 0733 on 1890.0; GCC-Stonehaven Radio, UK, announcing navigation warning broadcast at 2140 on 2719.0; DAN-Norddeich Radio, Germany, announcing traffic list at 0533 on 2641.0; GKZ-Humber Radio and GNF-Northforeland Radio in the UK announcing traffic list at 0533 on 1869.0; FFB-Boulogne Radio announcing traffic list broadcast at 0535 on 1770.0. All transmissions in USB. (Ary Boender-Netherlands)
- 2390.0 PCMS-m/v Alstern working m/v Heemskerkgracht in USB at 1932. PIEJ-m/v Varnebank working m/v Balticborg in USB at 1938. (Boender-Neth)
- 2953.0 SYN2-Israeli Mossad number station in AM at 0234. (Bill Fernandez-MA)
- 3006.0 Two fishing boats in comms about fishing ops with swearing and complaints about owners of boats. Sounded like off New England coast from accents in USB at 0517. (Fernandez-MA)
- 4227.0 IGJ42-Italian Naval Radio, Augusta, with V CW marker at 2348. (Dix-NY)
- 4372.0 7SH unsuccessfully calling Dracula but worked 7VD: "Playground activity." 4373.0 quiet and 4372.0 active periodically during the week. (Jeff Haverlah-Humble, Texas)
- 4373.4 Chalice Alpha working Crisco on this fractional frequency in USB at 1200. Moved here (four three seven three decimal four) by Crisco from 9023.0. (Haverlah-TX)
- 4504.0 FJ42/59-Unid station sending a V CW marker at 0014. (Dix-NY)
- 4665.0 VLB2-Israeli Mossad number station in AM at 0250. (Fernandez-MA)
- 4763.0 Numerous UNPROFOR Naval stations using tactical calls working each other at various times in USB. (Boender-Neth) / assume that this ops was off the Balkans-Larry.
- 4777.0 Combination number/letter, letter/number station using CW at 0355. (James Laughlan-Youngstown, NY)
- 4779.0 3/4-digit number station transmitting in CW at 0808. (Dix-NY)
- 5045.0 English female 3/2-digit number station in AM at 0017. (John Heys-Omaha, NE)
- 5091.0 English female 5-digit Israeli Mossad number station in AM at 0220 (Tuesday UTC). (Fernandez-MA)

- 5205.0 English female 4-digit number station in Am at 0035. (Dix-NY)
- 5207.1 USNG (?) stations AT3TVA and AT3TPA using 300 baud packet at 2326. (J.Metcalf-KY)
- 5310.0 UNPROFOR Naval Operations heard here using tactical calls at various times in USB. (Boender-Neth)
- 5341.5 FDY-FAF Orleans Air, France, with CW V marker at 0008. (Dix-NY)
- 5435.0 Two guys talking about getting supplies, food, beer, etc most of it was totally unreadable. Possible oil rig platform in USB at 0400. (Jeffery Jones-Tracy, CA)
- 5592.0 Unid station sending hand sent 5 figure CW groups at 0013. (Dix-NY)
- 5680.0 Plymouth/Edinburgh RCC working various units around 0727-0807 for training in USB. (Boender-Neth)
- 5696.0 CG COMSTA Boston working various aircraft with search and rescue in USB at 1710. (Jim Ashe-Weymouth, MA)
- 5861.5 LYNX-MFA Lagos, Nigeria, with CW call sign/SITOR-A idler at 0047. (Dix-NY)
- 6288.0 IGJ43-Italian Naval Radio, Augusta, with V CW marker at 0021. (Dix-NY)
- 6348.0 HWN-French Naval Radio, Paris-Houilles, with V CW marker at 0100. (Pete Romeika-Rosemont, PA)
- 6370.0 UBE2/UBE4-Petropavlovsk Radio, Russia, CIS with CQ CW marker at 0902. (Dix-NY)
- 6390.0 IDQ3/4-Rome Naval radio, Italy, sending call sign in CW at 0031. (Dix-NY)
- 6412.0 9VG55-Singapore Radio with CW CQ marker, Notice to Shipping message and traffic list broadcast at 1027. (Dix-NY)
- 6415.0 7TF4-Unid station with CQ CW marker at 0250. (Bob Pettengill-Blanchard, OK) Bob, this is Skikda Radio, Algeria-Larry.
- 6475.0 HMZ-Pyongyang Radio, North Korea, with CW CQ marker at 1002. (Dix-NY)
- 6510.0 SPO31-Szezcin Radio, Poland, in USB with a female operator with a circuit adjustment tape in English "This is Szezcin Radio for radio tune," repeated at 0223. (Fernandez-MA) WCM-Cincinnati, OH (This is the marine Mississippi River Valley marine simplex channel) with river barge traffic in USB. (Pettengill-OK)
- 6735.0 Typical Fox Tango network operation: but call sign Romeo staffed with female and male operators with distinct UK English accents. British Romeo also heard later in week on 9023.0 with brief FT net activity. (Haverlah-TX)
- 6776.0 Unid station sending 300 baud packets and also noted some weak USB voice traffic most weekday afternoons and evenings. Voice comms is tactical. Anybody have any ideas on this one? (Larry Van Horn-Brasstown, NC)
- 7428.0 WGY908-FEMA Denver, CO, with phone patch to Utah Operations Center in USB at 1629. (Metcalf-KY)
- 7445.0 KPA2-Israeli Mossad number station in AM at 0318. (Fernandez-MA)
- 7500.0 Black List calling Ice Pack and Black List Forward to Nightmare. Coordinating a large exercise. Aircraft of all types being deployed along with numerous ground units in USB at 0400. Sounds like it might be US Marine Corps personnel out of Camp Pendleton, CA. (Jones-CA)
- 7685.4 NNNOXHD-USN MARS with call sign marker and messages for NNNUAL at 1802 using PACTOR mode. Interesting mode, guess we will be seeing more use of PACTOR in the future. (Metcalf-KY) Absolutely correct, especially on the MARS channels-Larry.
- 7695.0 German female 3/2-digit number station in AM at 0323. (Fernandez-MA)
- 7697.0 KPD402 and another unid station returning to '8 MHz' frequency at 0300 in USB. (Metcalf-KY) This is a NSEP/Bell telephone channel 50-Larry.
- 7698.0 Bob, Greg and Steve commercial fishers talking about tough times in the fish business. "The nights we don't go out we loose \$250.00", one replies. "Ya! Those are our most profitable nights!" then went to 3410.0 USB. Heard at 0628 in USB on this frequency. (Jones-CA)
- 7706.0 KPSM called by GRK6 in CW at 2319. (Dix-NY) Anybody know who these guys are-Larry?
- 7871.5 Unid station LNZA sending a call sign only CW marker and SITOR-A idling at 2335. (Dix-NY)
- 7873.0 Andrews AFB, MD working Air Force One on secondary frequency checking for best station location in USB at 2252. (Jones-CA)
- 7888.0 Spanish female 5-digit number station in AM at 0300 (Sunday UTC). (Tom Mazanec-Maple Heights, OH)

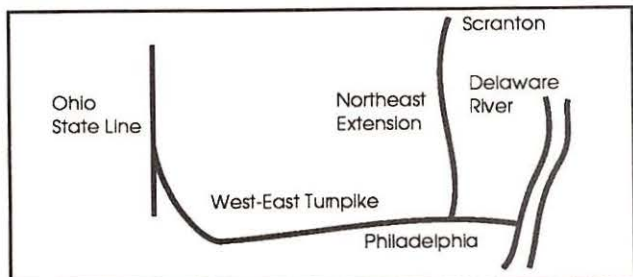
- 7930.5 R1R and P3S trying to contact I3C at 1740 in USB. (Jones-CA) *Interesting, Jeff, FEMA and Florida Department of Emergency Management has been reported here in the past-Larry.*
- 8004.0 Fishing boat Captain talking to his wife ashore - keeping tabs on family matters while out fishing. No IDs used during comms or when cleared in LSB at 0245. (Fernandez-MA)
- 8038.5 US Army or NG stations in USB at 1630. Calls included O4C, L0D and Y0Y. (Metcalfe-KY)
- 8038.7 G3U, N7X, P3U, and R2W military hospital units reporting bed status as occupied or available. Hospital designators were given as three letter groups: OPG, SGS, SOR, SNS, SMF, SUR, SOP, SBN, STH, and SCI. Then G3U working N7X "Will place all classified documents in a hole and destroy with a Whiskey Papa grenade." G3U then asks R2W for downwind report for long range missile delivering chemical nerve agent in USB at 1620. This frequency was a compromise, some units were on 8038.5 and some were on 8038.8 Didn't seem to bother them at all. (Jones-CA) *See Metcalfe logging above-Larry.*
- 8047.0 Q3J working G2I for radio check, then went to the next frequency down at 0120 in USB. (Jones-CA)
- 8122.0 Several Selscan bursts heard but no voice comms followed in USB at 0257. (Fernandez-MA)
- 8294.0 KPB525-Limited Coastal Station Galveston, TX, giving call and city then working *m/v Hawk Seal* in USB at 1320. KBK495-Limited Coastal Station Apollo Beach, FL working *m/v Katherine?* in USB at 2010. (Neal Perdue-Madison, AL)
- 8450.5 ROD7/8-Unid station sending a CQ CW marker then traffic list at 2202. (Dix-NY) *ROT-Moscow Naval is here so ROD7/8 are probably CIS Naval shore stations or collective calls-Larry.*
- 8469.0 XVG-Haiphong Radio, Vietnam, with CW CQ marker then traffic list at 1014.
- 8494.8 SLHFB 'S' using CW at 2329. (Dix-NY)
- 8494.9 SLHFB 'C' using CW at 2328. (Dix-NY)
- 8506.0 XSX-Keelung Radio, Taiwan, with CQ CW marker at 0949. (Dix-NY)
- 8628.5 NOJ-USCG COMSTA Kodiak, AK, with CQ CW marker at 1002. (Dix-NY)
- 8675.0 UQB-Kholmsk Radio, Russia CIS, with V CW marker at 1000. (Dix-NY)
- 8972.0 Shadow 05 "awkwardly" working J3L throughout the evening in USB. Whatever, J3L wanted to do, Shadow 05 couldn't comply due to not being able to go green. J3L asked if Shadow 05 was 'Cothorn' capable and operator was unfamiliar with the term, then told by a fellow crewman that they were not, which he relayed to J3L. Shadow 05 did advise that he was currently participating in the 'CN101' net. (Haverlah-TX)
- 8990.0 Mercedes, Mercedes 01, and Mercedes Quad and Tortuga working each other in the 'red' and mostly in the 'green' USB at 0401-0515. (Haverlah-TX)
- 8992.0 Stockholm Radio, Sweden, working '573' providing non-English phone patch in USB at 0303. Unpublished for Stockholm Radio, but heard here periodically. (Haverlah-TX)
- 9014.0 Kato 99 working Raymond 07 looking for status of "his receivers." Raymond 7 advised Kato 99 that his receivers were Vark 49 and 50. Raymond 07 said that they were in the air and on schedule. Both Vark aircraft heard on the air about 10 minutes later with signal checks in USB at 1928. (Haverlah-TX)
- 9023.0 Unid station working Air Force Perth, Australia, briefly in USB at 1255 then off. Also heard Lajes, Azores, using this frequency to provide phone patch to Reach 90025 in USB at 0448. QRM from scrambled comms on frequency, but did not seem to bother these two. (Haverlah-TX) Trenton military working Sidecar for radio check in USB at 2218. (Lonnie Bunn-Raleigh, NC)
- 9373.0 Unid station sending a Fax weather prognosis chart for the Mediterranean Sea. at 2328. (Dix-NY)
- 9914.0 KDM80-FAA mobile, location unknown working KCP63-Longmont, CO, for a signal check in USB at 1609. (Metcalfe-KY)
- 10161.0 Y7G with 5 letter groups in CW at 0042. (Metcalfe-KY)
- 10493.0 WGY912-FEMA Berryville, VA, asking an unid station to move to frequency NC04 in USB at 1605. At 1634, WGY912 asked station KMY70 to move to frequency NC02 (4458.0). I think the NC frequencies belong to KMY station; sounds like an exercise. (Metcalfe-KY)
- 10611.9 SLHFB 'C' in CW at 2150. (Dix-NY)
- 10766.0 Commercial fisher network passing four digit numbers. Most said good luck tomorrow after numbers were passed. Called each other by first names at 0100 in LSB. (Jones-CA)
- 10780.0 Cape Radio working various stations including Liberty Star, King 1 and 2, and USS Underwood in USB at various times. Used various frequencies including: 2716.0, 2820.0, 3120.0, 3187.0, 6937.0, 7461.0, 7675.0, 9006.0, 11104.0. (Bunn-NC)
- 10870.5 NAM-US Navy Norfolk, VA, with Fax weather charts at 2215 on a new frequency. QRM bad from VOA Europe and they moved back to their old frequency 10865.0 on the next day. (Pettengill-OK)
- 11053.5 X1S net control with L5B, V8P, Y0B, S1V, F6N, P1F, W7G with radio checks and some crypto at 1530 alternating USB and LSB. (Jones-CA) *Another interesting frequency Jeff, I have seen McClellan and Andrews reported here in the past-Larry.*
- 11070.0 NNN0FLC-USN MARS with SITOR-A messages at 2355. (Metcalfe-KY)
- 11104.0 Cape Radio working Aria 1 and 2 (Advanced Range Instrumentation Aircraft) setting up comms, going duplex 11104/13878 after 11621 rejected by Aria 1, said needed frequencies more than 10% apart. Cape Radio then puts Aria Engineering and station 28 (NASA facility, Jupiter, FL) into 'HF port'. Was off a satellite downlink of 261.900 in USB. (Richard Baker-OH)
- 11174.0 Willie Echo "Frank and other stations in a multi-vehicle moving convoy in the Satillo, Mexico, area passing Pemex stations, buses etc. enroute to a motel. These guys (probable Telmes U.S. contractors) still on daily during normal work week. Occasional QRM from powerhouses on 11176.0. Used USB at 1836. (Haverlah-TX)
- 11176.0 Hawk 85 working Raymond 37 via phone patch thru Offutt Global in USB at 0040. (Bunn-NC)
- 11201.0 USS California trying to establish contact with Wellington Star thru shore station in USB at 1528. Moved to frequency 12242.0 and then 8294.0 without success. (Bunn-NC)
- 11205.0 Aria 7 working Aria 1 advised first motion time was 17:14:36. Heard at 1715 in USB. (Baker-OH) *Welcome to the column Richard and good luck writing the Utility Notes for SPEEDX. Hope to see you in these pages often-Larry.*
- 11212.0 India calling Papa in USB at 2159, no contact. (Metcalfe-KY)
- 11234.0 RAF Gibraltar calling Cyprus Flightwatch in USB at 2005. (Boender-Neth)
- 11254.0 Tac Calls signs noted here talking about frequencies and 'Nuko' in USB at 1606. (Boender-Neth)
- 11351.0 Aircraft working a ground station in French, then went into scrambled mode, then back into the clear before clearing in USB at 1940. (Fernandez-MA)
- 12107.0 At 1903 all QSY to 12107/13787 (see 11104) and aircraft sending data. Later Aria Control heard. Spoke of plans to land at Ascension due to "has longest runway." Later planned QSY to 9132.0 simplex. (Baker-OH)
- 12283.0 DEA47-Germany with V CW marker at 1025. (Dix-NY)
- 12704.5 PKM-Bitung Radio, Indonesia, with CW CQ marker at 1013. (Dix-NY)
- 12747.0 MIW2-Israeli Mossad number station in AM at 0415. (Jones-CA) *KPA2 has been noted here in the past-Larry.*
- 12844.5 Royal Navy London (Northwood), UK, with Fax weather charts at 2007. (Dix-NY)
- 13204.0 Spectre 5 working Spectre 7 very briefly with HF radio checks in USB at 1732. (Haverlah-TX)
- 13208.5 Pearl Control calling and working Pearl 75 (Aircraft) in USB at 2029. (Haverlah-TX)
- 13412.0 65th Air Lift "Pack Ass 01" working Andrews AFB. Wants Hickum Global to take over comms because Andrews does not have the necessary station setup in USB at 1930. (Jones-CA)
- 13415.0 Spanish female 5-digit number station in AM at 0205. They repeated the broadcast several times apparently trying to sort out some transmitter problems. (Jones-CA)
- 14467.0 NNN0NZL-US Constellation (CV-64) Navy MARS working NNN0NUW with phone patch traffic in USB at 2348. (Perdue-AL)
- 15038.0 Beanpole working Transfer and Vocalist with STRATCOM type comms and authentications, IDing frequency as Xray-211 (this one) as primary, Xray-205 as secondary (nothing heard 11226 here until late in afternoon when 11226 became primary). Also mentioned Xray-212 (unknown frequency) as yet another frequency. All comms in USB at 1919. Also have heard the following designators mentioned with no luck on frequencies yet: Xray-212/ 213/907/Sierra-313/Whiskey-100. (Haverlah-TX)
- 17015.8 SLHFB 'S' in CW at 2349. (Dix-NY)
- 17444.0 5YE-Nairobi Meteo, Kenya, with weather Fax charts at 2218. Not listed in my references for this frequency. (Pettengill-OK) *I have them on my personal list; Bob and Klingenfuss/CFL do not list it, but it is in the new Shortwave Directory-Larry.*
- 17966.0 CIO2-Israeli Mossad number station in AM at 0445. (Haverlah-TX)
- 17992.0 Bookstore working Luckyhit with mention of W-118 at 2014. 9017 active with simulcast EAMs throughout afternoon. Also very strong DHM91 periodically calling German Air Force 051 in voice and selcal tones. (Haverlah-TX)
- 18881.0 English female 5-digit number station in AM at 1600. (Mazanec-OH)

The Scanning Report

Bob Kay

clo MT, P.O. Box 98
Brasstown, NC 28902

Figure 1



Monitoring the PA Turnpike

The Pennsylvania Turnpike is a 470 mile toll road that is patrolled by over 600 vehicles. Driving from West to East (Ohio line to Delaware River), the mile posts increase from 0.0 to 359.0. Driving on the Northeast Extension (Philadelphia to Scranton), the mile posts increase from A0.0 to A110.3. Locations along the turnpike are referenced by using a point system. For example, activity that is located halfway between mile marker 30.0 and 31.0 is referred to as mile post "30.5."

Turnpike communications are comprised of base and mobile communications. The various base and mobile frequencies are located in Figure #1. It is important to note that all departments, state police, roads, ambulance and fire trucks, have the ability to use the same frequency, and that turnpike frequencies are not limited to specific locations. Frequencies that are active on the Northeast Extension may also be utilized on the West-East section. One reader reports that frequencies on the western section of the Turnpike change approximately every 100 miles. To determine the active frequencies for a particular area, monitor the frequencies in Figure #1 and select those that are in use.

Fire and rescue services along the Pennsylvania Turnpike are contracted to local towns and/or cities. Emergency vehicles that service the turnpike are not limited to utilizing public access ramps. There are numerous emergency access roads that allow emergency vehicles to enter and exit the turnpike at a variety of locations. In addition to contracted services, each turnpike maintenance building has a special response team that is trained to handle medical emergencies.

Turnpike towing and road service are provided by contracted service stations. As previously mentioned, service vehicles can communicate directly with the State Police. If roadside repairs are possible, the State Police will advise the service mechanic of the problem. Broken fan belts, flat tires and other minor repairs are often corrected at the breakdown site.

Direct communications between all turnpike employees helps to limit the response time to calls for medical or mechanical assistance. The system also helps to control traffic violations. Maintenance crews, mechanics, emergency response teams and toll takers can easily help the state police to identify motorists who may be speeding or intoxicated.

During a recent trip on the Northeast Extension, the following frequencies were active between Philadelphia and Scranton:

154.755 Radar patrols 159.045 Base
159.00 Mobile to Mobile 453.30 Tunnel communications

On the Northeast Extension, hourly weather reports and road conditions are transmitted to all turnpike vehicles. Weather information is especially important during the winter months. The Northeast Extension is the direct route to the largest ski resorts in the state. Motorists, or "patrons" as they are referred to by the State Police, can receive updated weather reports and road conditions at toll and rest areas. Scanner buffs need only monitor the active frequencies to hear the reports "live."

The Turnpike State Police also have the ability to communicate with local police departments. Individual frequencies change between towns and cities, and communications are limited to the more populated areas that border the turnpike. To obtain further information on the Pennsylvania Turnpike system, contact the Public Information Department, Pennsylvania Turnpike Commission, P.O. Box 8531, Harrisburg, PA 17105.

Turnpikes are located in many states and monitoring them can be an exciting experience. A mobile scanning rig and a well stocked picnic basket will provide the perfect opportunity to take your family on a "scanpicnic." Have fun and write me with your turnpike adventures.

Treasure Hunt

This is the last month that you can win a top of the line Weather Station. The Weather Monitor II by "Davis Instruments" can instantly turn your scanning shack into a professional weather station.

The Weather Monitor II is as easy to use as your scanner radio. Simply push a button to instantly scan inside outside temperature, wind direction, wind speed and barometric pressure. The unit includes a digital display, recall of high/low temperature, high wind speed, chill factor, barometric pressure and much more.

Scanner buffs with computers in their shacks will be delighted to learn that the Weather Monitor II can be controlled with an IBM compatible computer. The [Weather Link](#) will allow you to create graphs, calculate weather conditions, generate summaries, and analyze trends.

State turnpikes
and other toll
roads are
popular moni-
toring targets.



The Weather Monitor II and the Weather Link will be awarded to a lucky winner. Here are the clues:

1. The Uniden Bearcat 800 XLT has a separate weather button to instantly access the national weather service. True or False?
2. The large damaging lightning bolts that occur during thunderstorms travel from ground to cloud. True or False?
3. Where is the coldest spot on Earth?
4. How much does the average cloud weigh?
5. Fill in the missing letters of this four letter word that is mainly responsible for spectacular sunsets: D _ S _.

The Weather Monitor II is supplied with the display unit, anemometer/wind vane, 40' of cable, external temperature sensor, junction box and A/C adapter. Erecting the combination anemometer/wind vane is easy. Simply bolt the unit to your existing antenna mast and route the cable next to your antenna coax cable.

For more information, contact Davis Instruments at 3465 Diablo Ave, Hayward, California, 94545. The toll free order line is 1-800-678-3669.

Frequency Exchange

Since we opened the column in Pennsylvania, let's travel around the state and check in with a few subscribers. Chad Cessna lives in **Ebensburg, Pennsylvania**, and his monthly list includes the following:

44.96	Fish Commission	151.295	Forestry
45.04	Fish Commission	151.445	Forestry air net
45.20	Cambria County Sheriff	151.745	Lee Hospital Security
47.14	Pennsylvania Dept. of Trans. (PENDOT)	153.110	Bethlehem Steel
		155.085	Ebensburg Borough Highway Maint.
47.30	PENDOT		
47.70	Highland Sewer & Water	453.200	Cambria County Police
		460.325	Logan Township Police
151.175	Forestry	460.425	Altoona Police

Another Pennsylvania invitation arrived without a name. Here are a few frequencies from our anonymous contributor.

44.84	Fish Commission
151.385	Forestry
151.400	Forestry
155.370	Washington Crossing State Park
153.935	Washington Crossing State Park
450.550	Channel 3, "Eyewitness News"
455.050	Channel 10, WCAU
455.450	Channel 6, "Action News"
461.825	Channel 12, WHY?

Traveling south along the Eastern Seaboard, our next stop is **Wilmington, North Carolina**. Here are a few of the popular coastal beach frequencies that are monitored by Jamie Moncrief.

155.025	New Hanover Life Guard stands	453.95	Carolina Beach Police
		453.90	Yaupon Beach Police
453.10	Wrightsville Beach Police	453.80	Long Beach Police

Reggie Pruitt lives in **Shelby, North Carolina**, and his invitation included the following:

42.640	Highway Patrol	154.875	Law Enforcement
153.95	Kings Mountain City Fire Dept.		Mutual Aid
		155.28	Statewide Rescue
154.16	Shelby City Fire Dept.	155.685	Cleveland Co. Sheriff Dept.

GUIDE TO FACSIMILE STATIONS

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The recording of FAX stations on longwave and shortwave and the reception of meteorological satellites are fascinating fields of radio monitoring. Powerful equipment and inexpensive personal computer programs connect a radio receiver directly to a laser or ink-jet printer. Satellite pictures and weather charts can now be recorded automatically in top quality.

The new edition of our FAX GUIDE contains the usual up-to-date frequency lists and precise transmission schedules - to the minute! -, including those of all US Coast Guard and US Navy stations worldwide. The new Bracknell and Washington meteorological telefax polling services are also described. The book informs you with full details about new FAX converters and computer programs on the market. The most comprehensive international survey of the "products" of weather satellites and FAX stations from all over the world is included: 337 sample charts and pictures were recorded in 1992 and 1993! Here are that special charts for aeronautical and maritime navigation, the agriculture and the military, barographic soundings, climatological analyses, and long-term forecasts, which are available nowhere else. Additional chapters cover abbreviations, addresses, call sign list, description of geostationary and polar-orbiting meteorological satellites, regulations, technique, and test charts.

Further publications available are *Guide to Utility Radio Stations* (11th edition), *Radioteletype Code Manual* (12th ed.) and *Air and Meteorological Code Manual* (13th ed.). We have published our international radio books for 24 years. They are in daily use with equipment manufacturers, monitoring services, radio amateurs, shortwave listeners and telecommunication administrations worldwide. Please ask for our free catalogue, including recommendations from all over the world. For recent book reviews see MT 4/93 page 90 and SPEEDX 2/93 page 43. All manuals are published in the handy 17 x 24 cm format, and of course written in English.

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155.745	Cleveland Co. Rescue	158.76	Cleveland Co. Fire
156.210	Shelby City Police Dept.		

An anonymous reader in **Peoria, Illinois**, sent in the following:

154.10	Bartonville Police Dept.	158.79	Peoria Sheriff
154.57	Mark Twain Best Western	460.075	East Peoria Police
155.07	Tazewell Police Dept.	460.225	Peoria Jail
154.875	Peoria Police Dept.	464.525	Peoria Civic Center
155.67	Chillicothe Police/Rescue 3		security
158.73	Peoria Sheriff		

In **Chester, California**, we'll stop in to visit with Steven Gibson. Here are Steve's frequencies. The following are pre-assigned incident TAC Nets (air to ground):

If the assigned command frequency is:	Ground Tactical will be:	Air to ground tactical will be:
151.250	151.175	151.220
155.4875	168.300	170.00
172.225	168.200	170.00

Other California frequencies:

151.715	Feather River Rock Co.	158.310	Collins Pine Co.
151.775	Jones Spacelink Catv Co.	158.355	Collins Pine Co.
151.805	Mount Lassen Power Co.	160.605	Union Pacific Railroad
151.985	Citizens Utility Tele. Co.	451.150	PG&E
153.575	Pacific Gas & Electric (PG&E)	451.500	Alltel Telephone Co.
		451.575	Taffi Forest Management
153.65	PG&E	461.100	Plumas County School
154.515	Lake Almanor Ctry Club		Dist.

Steve's complete list for Northern California contains more than 150 frequencies. To receive your free copy, send a #10 SASE to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Our final invitation is from Royal Jaynes. While vacationing on the Caribbean island of *Aruba*, Royal monitored the following active hotel frequencies:

151.290 160.175 162.250 163.750 164.375

You can invite the Frequency Exchange to your neck of the woods by sending us a copy of your favorite frequencies. Hand printed, typed lists, or computer disks are welcomed. Send your frequencies to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Scanning for Fish

When Elmer Robinson hooked a Steelhead Trout in Idaho, he noticed that the fish was outfitted with a small transmitter. The frequency marked on the transmitter was 149.720 and it transmitted a "Tic" sound every five seconds.

On further investigation, Elmer learned that the Idaho Fish and Wildlife Research unit outfitted 500 Chinook Salmon and 700 Steelhead with radio transmitters. Movements of the fish were recorded with the use of fixed site receivers and mobile tracking units. The frequencies ranged between 149.32 and 150.02 MHz. The average life expectancy of the transmitters is about nine months. Transmitter range is approximately one kilometer by aerial antenna and thirty kilometers by underwater antenna.

Cellular Bug

An anonymous reader reports that some cellular phones will answer an incoming call and instantly go "live" without producing an audible ring. At first thought, this doesn't seem to be a problem. But let's take it a step further. Suppose that the phone is strategically placed in a security area. To hear the confidential conversations in that room, the caller dials the number of the cellular phone and a silent connection is made.

Is it possible? What do you guys think? Does anyone have a cellular phone that can silently answer an incoming call? If so, I'd like to hear from you. Send your comments to the Scanning Report, P.O. Box 98, Brasstown, NC, 28902.

Scanner Tip-Offs

- In San Antonio, Texas, a sheriff's dispatcher received a call from a scanner buff who said that he had been monitoring the cordless phone band.

The scanner buff informed the dispatcher about a drug deal that would take place that same evening. Acting on the tip, Sheriff deputies staked out the location and arrested two men.

(News clipping from *San Antonio Express*.)

- In Augusta, Maine, a man has been charged with the armed robbery of a credit union. The tip which led to the man's arrest came from a woman listening to a scanner radio.

The woman called police to tell them that a man fitting the description of the suspect was walking past her window. Police tracked the man to his home and made the arrest without incident.

(News clipping from the *Morning Sentinel*.)

Killer Radio Waves

It all started on the *Larry King* show. David Reynard, of St. Petersburg, Florida, appeared on the program and said that his wife's fatal brain tumor was caused by a cellular phone.

Since that time, three other people have made similar allegations. Cellular phones were identified as the culprit because the brain tumors were located near the area where the cellular phone antennas pressed against their skulls.

Doctor Stephen F. Cleary, a biophysics professor at the Medical College of Virginia, discovered that when brain tumor cells are exposed to two hours of radio waves, the cells grew 30 percent faster than unexposed cells. The radio frequencies used by Doctor Cleary were directly above and below the frequencies that are used for cellular phones. Because the frequency of a cellular phone falls between the two, Doctor Cleary believes that his findings are relevant to the current debate.

In the 1988 *American Journal of Epidemiology*, Dr. Samuel Milham Jr. found that ham radio operators suffered from significantly elevated rates of acute Myeloid Leukemia. Doctor Milham contributed the rise of Leukemia in ham radio operators to the use of radio equipment that operated at an average of 100 watts.

As you probably can guess, there are other prominent professionals who claim that stray radio waves (like the ones that you and I monitor), can also have an adverse affect on the human body. And don't forget about the electromagnetic fields that are produced by power lines. Sure, it's another matter entirely, but the effects are the same—the risk of cancer seems to be elevated.

At this writing, the results are not conclusive. Doctor Cleary suggests however, that radio waves cannot start a malignant growth. Instead, he suggests that radio waves may accelerate the growth of small tumors that already exist.



Canadian Problems

In the Canadian district of Algoma, the new telecommunications system has had its share of problems. For openers, the cost of the system soared to \$106.9 million. The numerous natural rock barriers produced "dead spots" that won't be fixed for another year.

Police officers complained that they couldn't turn off their mobile radios. They were told to press the "on" button twice to shut off the radio. Squirrels found their way into the dispatch center and a bear gnawed on a transmission cable, decreasing radio communication quality.

Weather also became a problem when equipment froze in the middle of winter and was not functional until the arrival of spring. Police officers are not happy with the new system. "The old system had its share of problems," a patrolman said, "but at least you didn't need a manual to turn the darn thing off." (News clipping from the *Sault Star*.)

Old Phones

Prior to the days of cellular phones, people talked on the old mobile phone frequencies. These frequencies are still in use and can be monitored by searching through the following: 152.030 to 152.210; 152.510 to 152.810, 454.025 to 464.650 MHz.

Next Month

Summer will be over, but the scanning excitement continues. Don't miss a single edition—check your subscription renewal date today!

Plug into the FCC with Grove's FCC Database ON DISK!

Now, with the aid of Grove's own database search program, you can have the vast FCC database at your fingertips! Search through useful fields like: FREQUENCY, CALLSIGN, LICENSEE, SERVICES, CITY, COUNTY, STATE, LATITUDE, AND LONGITUDE. With the new county, latitude and longitude fields, you can search out specific geographical areas for the listings you want!

The Grove FCC Database On Disk also allows you to output your search ranges to a printer, your computer screen or to a file! So, if you need a quick printout of all of the frequencies used by the police, fire, business--or whatever--in your city, it's there for you!

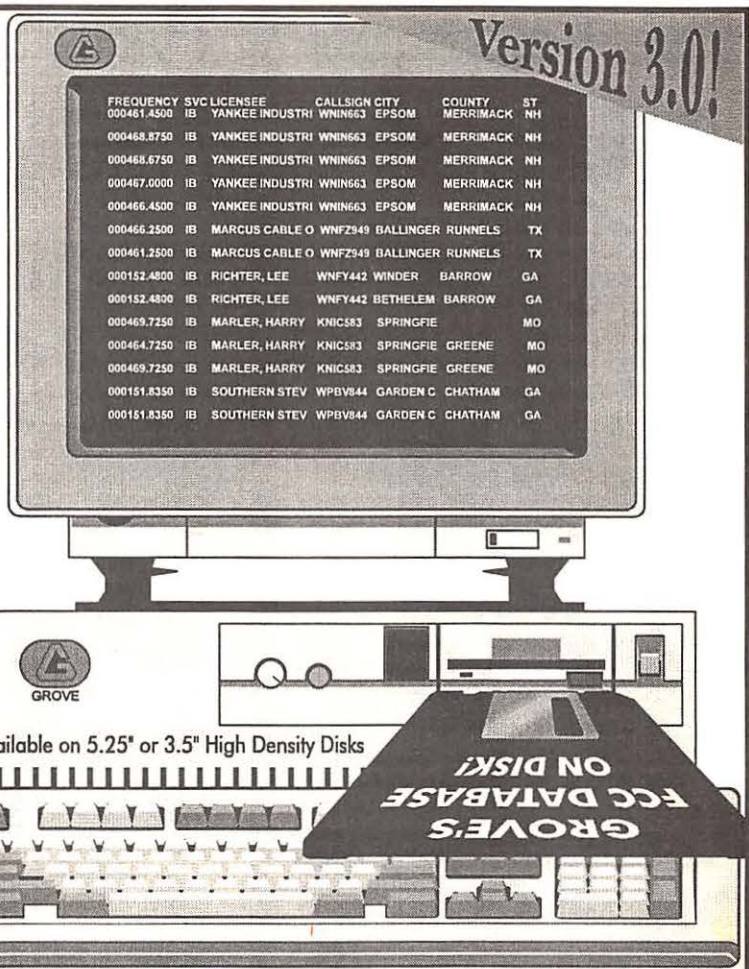
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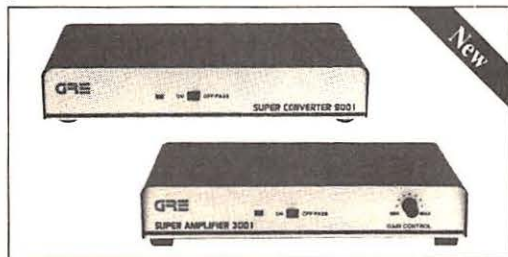
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Improve Your Scanning Coverage!

GRE America is proud to introduce a new family of products to enhance your scanning pleasure! First, GRE has designed the new **Super Converter 9001** for base model scanners. The 9001 converts 810 MHz - 950 MHz down to 410 MHz - 550 MHz. The 9001 is the perfect alternative to buying a new, expensive scanner covering the 800 MHz band. Next, GRE announces the new **Super Amplifier 3001** for base model scanners. The 3001 will increase gain by as much as 20 dB, and is engineered to help scanners with low sensitivity pull in weak signals. Both products use BNC connectors, (1) 9 volt battery and have an off/pass switch for returning to normal operation.



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Cool Summer Reading

Genie T.AREY1

The month of August always reminds me of when I was a kid. August was always hot and sticky. We didn't have air conditioning in our home when I was growing up. It was probably the greatest gift my parents gave to me (and they didn't even know it!).

Okay, you've got the sweat dripping down our noses; get on with it, Uncle Skip!

There was one place that was air conditioned in my young life. It is where I spent many wonderful (and cool) summer days, and where I discovered most of what I value in the whole world: THE PUBLIC LIBRARY! I can still remember checking out Robert A. Heinlein's *Space Cadet* for the first time. My life has never been the same.

Always in search of a great new Beginner's Corner topic, I was wandering through the stacks, just as I did so many years ago, with the intention of digging up some great radio resources. Dust off your library cards and clean your spectacles, it's time for...Uncle Skip's Guide to the Public Library.

I like to approach the library with an open mind. Sure, you can go in and look up a book in the card catalog. Instead, I often walk in with an idea and then just wander around looking for things that apply. This can take more time (and I wouldn't recommend it if you had a paper due at school the next day), but it is a great way to discover tons of new things that you may not have considered if you went to the card catalog first.

Atlas Shrugged

First of all, the plural of *atlas* is *atlases*, NOT *atli*! If you believe the newspapers, Americans just don't know their geography. Supposedly we all think Wyoming is another country and Vilnius is two blocks down and right at the next light. Yet, for radio monitoring, knowledge of geography is real power. Most dedicated DXers have an atlas or two tucked into their personal book shelves. But very few radio hobbyists can afford to purchase the large and extensive atlases found in public or school libraries.

The amount of information that can be discovered from the charts and tables in most high quality atlases can be indispensable to a beginning monitor. Obviously, a trip to the atlas of your choice will show you just where a broadcaster is located. You will also discover tables that will help you compute the distance from your listening post. There will even be world time conversion charts. Scanner monitors will benefit from individual country and state atlases to zero in on their scanning catches.

But that's the easy stuff. Your library is also likely to have atlases that will help you understand prevailing weather, economic and political conditions that all might give you clues to better listening.

Are You Gonna Read It or Buy It?

As a kid I was chased away from more than one store's magazine rack. Libraries have dozens

of magazines and nobody will chase you until closing time. Most libraries have a good spread of magazines in the area of electronics, science and technology that will give you great information useful to the radio hobby. But also keep an eye open for travel and foreign affairs magazines that will clue you in to the world around you.

Somewhere, over near the magazine racks, you will also find newspapers. You will often find newspapers from the surrounding area that will help scanner monitors keep track of local events. National newspapers, those from major cities, often carry articles on the radio industry as well as national news in depth that can guide your listening.

Are you getting the drift of this column yet? Getting to know the world, via your library, will make you a more accomplished monitor. It will make you a better person, too, Compadre!

Books, Books, and More Books

Even the most dedicated (and well off) radio monitor will be hard pressed to possess all the literature that could be useful in the radio hobby. That is why local library membership is essential. A quick journey through the aisles indicates just what Old Uncle Skip is trying to get across here.

Foreign language education books, (usually with accompanying tapes) may just help you figure out a few of those broadcasts that you couldn't quite put your finger on. Some stations' QSL cards and letters are written in the country's native tongue. If so, a cross language dictionary should help you get the gist of what was written.

Many DXers like to add more personal touch to their reception reports. This is very useful when sending a QSL request to a country or station that does not routinely receive distant mail. Check the shelves and grab a book about the particular country. If you want a really quick overview, head for the youth or children's section of the countries of the world. You will discover enough information to add a few interesting questions to your next reception letter. (e.g. "I understand that Freedonia used to be the chief supplier of viaducts to Nibi Nibi. Is this still true?") These cogent questions will make your report stand out from all the rest.

Technical books are an obvious choice for radio hobbyists. I looked up the word RADIO in our local library's card catalog and found 74 volumes listed. But don't be so narrow in your search. Many other scientific and technical headings will help you on your pathway to expert monitor. Take the time to look up such topics as computers, weather, satellites, broadcasting and communications. Again, don't overlook topic headings such as geography and foreign affairs.



Many libraries offer meeting rooms where clubs can gather.

Reference Remarks

Perhaps the largest (and often most under utilized) section of any modern library is the REFERENCE SECTION. These are books in the permanent collection that are not usually available for borrowing. The reference section will include hundreds of books that contain data on every subject imaginable.

The reference section includes the various ENCYCLOPEDIAS. Remember plagiarizing two hundred words on Davy Crockett just to please your fifth grade teacher? Don't overlook the good old encyclopedia in your quest for country information. One prominent DXer entered an essay contest from a foreign broadcaster with information gleaned from an encyclopedia. He won a round trip tour to that foreign land—all by a quick trip to the library and a few hours of research. Sounds like a great deal to me. Many shortwave stations offer such contests. Keep an ear to your receiver and keep your passport up to date. You could be next!

The reference section is much broader than a few racks of encyclopedias, however. The reference stacks in my local haunt included *Passport to World Band Radio* and the *Scanner Master Guide* for my local area. If you are short on pocket money, it's good to know you can access some radio monitoring tools anyway. The regular "borrowing" stacks had the *Short-wave Listeners Handbook* by Bennet, Helms & Hardy. You can save money and read this book until Old Uncle Skip gets around to writing his beginner's opus.

My reference section expedition turned up a real find. One of the frustrations of both AM and FM Broadcast Band monitoring is keeping up with current station information and addresses. Each month dozens of stations come on the air, change callsigns, move their offices, modify their power or antenna pattern and (sadly) go off the air. Keeping a handle on all these changes can even outstrip the best efforts of the club publications dedicated to this aspect of the monitoring hobby. More than a few of my reception reports have come back "Return to Sender, Address Unknown." However, my library's reference section provides a great tool to save me a few stamps: a subscription to the *SRDS-Spot Radio Rates and Data Service*. Published monthly by the Standard Rate and Data Service, this gives me up to the minute information on all essential aspects of the station's operation. Best of all, these books give the names of people working at the station. Your reception report is much more likely to get noticed if it is addressed to an individual. Incidentally, the SRDS folks also have a *Spot TV Rates and Data Service* for you TV DXers.

Most reference sections carry at least one industrial information guide. One of the more famous is *The Thomas Register*. If you want to get an idea about what is going on in the electronics and communications fields, this is a great place to look. You will also find addresses and catalog information for just about any product or service you can imagine. While this reference is designed for business use, you will still discover many vendors that are willing to deal with individuals.

While in the reference section, see if it includes the *Cities of the World* series by Young & Stetler. You will become very cosmopolitan overnight reading through this collection of essays, and it could help you generate great reception reports.

Many larger libraries are likely to employ an actual Reference Librarian. This is a person whose very reason for living is to help you make the best use of the library's reference materials. I have never met a reference librarian that was not extremely patient with my many questions. So don't forget the human resources among the many printed ones.

And Now For Something Completely Different

Over the years of writing for *MT*, I have produced several well received columns on designing and building a listening post. Where can a beginner

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learn the basic carpentry skills needed to create a great radio shack? At the library of course! Modern libraries have become real multimedia centers. Check out the video collection in yours. You are likely to find a few videos on carpentry, remodeling, even plumbing and electrical work. Why should Bob Vila have all the fun?

Also since more and more radio hobbyists are discovering that computers are useful tools, you might want to check out the video collection for tapes on basic and advanced computer skills. I found one in my library that actually helped me make sense of my data base program. One picture is worth a thousand words but a video has to be worth a billion words at least.

Join the Club

Old Uncle Skip and *MT* get many inquiries about radio hobby clubs. If there are none in your area, you may want to try to start one of your own. Public libraries often have meeting rooms that are available for just such a purpose. If not, you will find that it may be possible to post a sign or two about your desire to develop a club on the library's bulletin boards. One of the first ways your club can return the favor is to donate an *MT* subscription to the library. My local library has long been the meeting place of both a radio and a computer club. It's a wonder I ever come home at all!

So what are you waiting for? Head on down to the library and cool off. The last time I went, I checked the reference section and found a series of books called *Contemporary Authors*. I found William and Richard Van Horn listed but not Larry or Gayle. I found James and Leslie Arey listed, but not Old Uncle Skip. I did find a write up on Robert A. Heinlein, though. It even gave his address. I plan to write his widow a nice letter reminiscing about checking out that copy of *Space Cadet* so long ago.

MT

What's Your Sign?

"Big Duke to Rambo," "Spear to Shadow..." Anyone who listens to military communication will immediately recognize these colorful names as military callsigns. New ones pop up from time to time and sometimes it is hard to keep track of who is who. "HAWK" used to be a B-1B callsign, but this week it's being used by a KC-135. Is there any such thing as a list of military identifiers?

Many of the letters coming across this editor's desk ask just that, especially in light of the massive changes in the U.S. military structure. With the communications shuffle finally settling down, many new callsigns are being identified. Table 1 is our list of current military identifiers (callsigns).

The list isn't complete, and it never will be. New callsigns come and go on almost a daily basis, but certain callsigns have remained the same for years. If you log some unique identifiers that aren't on the list, send them in to the Federal File.

Table 1: Military Identifiers

AGAR	Wright-Patterson 4950th Test Wing aircraft	CHIPPY	VFA-195 Lemoore NAS CA	GRUMPY	F-16s Hill AFB
AIREVAC	Any aircraft on medical airlift mission	CHIVAS	F-117s Holloman AFB NM	GUNFIGHTER	Oceana NAS VF-101 F-14s & HMLA-369 Pendleton & VA-75 Oceana NAS
AIRGUN	F-16s Hill AFB	CIRVIS	Unidentified flying object report		VA-75 Oceana NAS
AKSARBEN	Wurtsmith AFB CP	CITY DESK	VF-154 Miramar NAS	GUNTRAIN	Grissom AFB KC-135s
ALPHA MONITOR	Controlling STRATCOM com station	CLOVER	Michael AAF at Dugway Proving Ground UT or Hill AFB GCI	GUSS	Royal Thai AF at Waltana Nakhom also USN F-14s
AMBUSH	Oceana NAS VF-43 A-4 & F-16s Hill AFB			GYPSY	VF-14 CVW-3
ANCHOR	Langley AFB 6th ACCS EC-135s	COLD	F-16 388th FW Hill AFB		Army Ops at Truth or Consequences NM
ANDY	Andrews AFB, MA	COMBAT	MD ANG 113th FW F-4s at Andrews AFB	HALIBUT	USAF CP portable comms package from Scott AFB
ANGEL	Same as Pedro, except usually UH-1 helo	CONVOY	Hill AFB CP	HAMMER ACE	Eglin AFB 4486th FWS
APACHE	Albuquerque Int'l Airport	CORVETTE	F-16s Hill AFB	HAMMER OPS	Commander Naval Forces Caribbean
AARDVARK	Navy VF-114 Miramar NAS CA	COSMIC	F-16s Hill AFB	HAMPSHIRE	USS Forrestal
ARCTIC	F-16s 388th FW Hill AFB	COSTLY	Scott AFB AMC ALCC	HAPPY HUNTER	Point Loma Range
ARIA CONTROL	Wright-Patterson 4950th Test Wing CP	COTY	C-130s/C-141s base unknown	HARDBALL	Scott AFB CCT Tech Control
ARIZONA PETE	Luke AFB NORAD Ops	COURAGE	USS America	HASSLE	Miramar NAS
ARMY 1	Army helicopter President on board	COVERED WAGON	Confirmed hostile action	HAWK	T-38s Dyess AFB
ASPEN	Beale AFB KC-135Q's	COWBOY	C-130s Francis E Warren AFB	HAWK	B-1s 96th BW Dyess AFB
AURORA	F-15Es Luke AFB		C-5s 436th MAW Dover AFB	HEARTPOWER	White House transportation
AVALON	C-9A aircraft from 37th AAW & 11 AAS at Scott AFB	COWBOY CONTROL	Carswell AFB CP	HELPING HAND	Threat of hostile act
		CRADLE	Kirtland AFB 1550th Air Training & Test Wing CP	HERSHEY	Key West Joint Air Recon Control Center
BALKY	Range Bombing Control Fort Indiantown GAP/MuirAAF	CROWN	White House Communications Agency	HILDA	Scott AFB AMC HQ Command Center
BAMA	AL ANG F-16s from 187th FG	CRYSTAL PLACE	Wurtsmith AFB CP	HOMEPLATE	Homestead AFB
BANDSAW	E3As from 964th AWACS Sqdns	CYBORG	F-16s 419th FW Hill AFB	HOMER	General call for VHF/UHF DF assistance
BARON CONTROL	Nellis AFB GCI	CYCLONE	NORAD F-15s Southwest US sector	HOOTER	F-16s Shaw AFB
BATTER UP	Any NAVCOMSTA	CZAR	B-52s 92nd BW Fairchild AFB	HORMEL	USN VAW-114 Squadron Miramar
BATTLESTAR	USAFR 910th AG CP at Youngstown	DAGRAT	Edwards AFB range control	HORN	Beale AFB SAC radio-also Liberty
BATTLEWAGON	Oceana NAS VF-11 F-14s	DARKSTAR MIKE	NORAD Ops	HORNPIPE	Cannon AFB
BEAK	F-16 419th FW Hill AFB	DETONE	AWACS aircraft	HOTUPS	Moody AFB
BEER	F-16 418th FW Hill AFB	DEVIL	F-14s 48th FIS Langley AFB	HUGO	Army helicopter on SAR scene
BENT SPEAR	Significant nuclear accident	DIAMOND	VFA-146 Lemoore NAS CA	HUMMER	NAS Weymouth 49th MAG, UH-1/2 helos
BEST	Shaw AFB 363rd TAC Recon Wing RF4Cs	DIAMOND BACK	VF-102 Oceana NAS	HUNTRESS	Griffis AFB NY NORAD/ADTAC Northeast ROCC
BETSY	Eglin AFB tanker aircraft	DIAMOND OPS	419th FW Operations	HURON	Wurtsmith AFB KC-135s
BLUE ANGELS	Navy Flight Demo Team Pensacola FL	DISCARD	Oceana NAS VF-102 F-14s	HURRICANE	HM-15 Alameda NAS & HS-2 North Island
BLUE KNIGHT	Dobbins AFB Lockheed security unit	DOGPATCH	Travis AFB 22nd AF AMC Operations	HURRICANE HUNTER	Keesler AFB Gull Squadron
BLUE THUNDER	Dyess AFB CP	DOOM	Castle AFB CP for tanker a/c	HOSTAGE	VMO-2 Pendleton
BOLIVAR	Hanscom AFB Ops		B-52s 2nd BW Barksdale AFB DORSALF-16s base unknown	ICEMAN	F-16s Hill AFB
BONE	B-1s 12th Ad Ellsworth AFB	DORSAL	F-16s base unknown	IMPACT	C-130s base unknown
BOSOCKS	F-15s Holloman AFB NM	DRAGNET	E3A AWACS Tinker AFB	INCOGNITO	NORAD Ops at Syracuse-Hancock Airport NY
BROKEN ARROW	Damaged nuclear weapon	DRAGON	B-1Bs Dyess AFB Abilene, TX	IRISH MST	VS-41 North Island
BUNKER HILL	KI Sawyer AFB CP	DROPKICK	Offutt AFB HQ CP	IRON	Langley AFB 71st FS
BURGLAR	Kirtland AFB CP	DUKE	F-111s Cannon AFB NM	IRONROD	USN Undersea Test/Evaluation Cntr at West Palm Beach
BURNING BUSH	NAS Whidbey Island	DULL SWORD	Nuclear incident	IRONROD 1	USN Undersea Test/Evaluation Cntr at Andros Island
CAJUN	A-10 926th FG New Orleans NAS	EAGLE	President Bill Clinton		
CAPROCK	NV ANG Ops at Cannon Int'l Airport Reno	EAGLE CLIFF	USS John F. Kennedy	IVORY	Little Rock AFB 314th AWC-130s-also reported as Dyess AFB 463 FW
CAPSULE	General call to all AMC aircraft	ELECTRIC	NEACP (EFA, Modified 747)	JABBA	Unknown stealth aircraft based near Holloman AFB NM
CARBON COPY	Kelly AFB CP	ELSIE	Ft Benning AAF possibly (ICAO identifier KLCF)	JACKLE	F-16s 419th FW Hill AFB
CHECKMATE	Tinker AFB 963rd AWACS duty officer & VF-211 F14s Miramar CA	ELVIS	HMM-261 New River	JAMBO	Barksdale AFB 2nd BW B-52s
		ERIE	Barksdale aircraft-possibly temp call	JASPER	F-16s 388th FW Hill AFB
CHEROKEE	White Sand Missile Range NM	ETHEL	KC-135 tankers Dyess AFB Abilene also KC-135s	JEDI	F-16s Hill AFB
CHEVY	F-117s Holloman AFB NM possibly TR-3s		Altus AFB OK	JOSHUA	Edwards AFB Approach Ctrl
CHILL	B-52s 5th BW Mnt AFB	EVERGREEN	First Lady Hillary Clinton	KISKA	Ellsworth AFB B-1s
CLIMAX	USS Enterprise	EXECUTIVE 1/2	Press US or Vice Pres aboard non-military aircraft	KLEENEX	Scott AFB
		EXECUTIVE 1 FOX	Press US or Vice Pres aboard non-military aircraft	LACTOSE	Shaw AFB
		EXXON	Barksdale AFB KC-10s	LARK	McClellan AFB RC-135/WC-135 aircraft
		FADED GIANT	Radiological incident/accident	LAZAR	Carswell AFB B-52s
		FAIRFIELD	USS Saratoga	LEAHI	B-2 Stealth Bombers
		FETCH	HS-4 North Island	LIFTER	C-141 nickname-used sometimes as tactical callsign during paratroop drop missions
		FEVER	NAS North Island		YF-22 Advanced Tactical Fighter
		FIERCE ALPINE	RI ANG Ops at Quonset State Airport		Civilian aircraft under contract to USAF
		FIRESEIDE 1	Langley AFB		
		FIRESEIDE 3	Shaw AFB 9th AF HQ		
		FIRESEIDE 4	Mountain Home AFB		
		FIRESEIDE 5	Bergstrom AFB 12th AF HQ		
		FIRST FLIGHT CTL	Seymour Johnson AFB CP		
		FISHER	NASA Cape Radio to NASA ships		
		FISHER BODY	ATC Guantanamo Bay Cuba		
		FLAG PLOT	USCG HQ Ops Center in Wash DC		
		FOGGY	Alameda NAS		
		FUJIN	F-16s Hill AFB		
		FURIOUS	Albrook AFB South American ALCC		
		GASPIPE	Possible "Aurora Project" Hypersonic aircraft		
		GHOST	FA-18s El Toro MCAS & YF-22A Edwards AFB CA		
		GHOSTRIDER	AAF CP at Ft Rucker		
		GHOSTWALKER	NAS Whidbey Island aircraft		
		GIANT KILLER	NAS Oceana FACSAC Virginia Capes		
		GIANT TALK STRATCOM	HF radio communications net		
		GLASS EYE	USAF aircraft on NUDET visual observations mission		
		GOLD EAGLE	USS Carl Vinson		
		GOLDEN	ACC UHF net		
		GORDO	Offutt AFB E-4s		
		GRAND SLAM CTL	Grand Forks AFB STRATCOM CP		
		GRAY EAGLE	USS Ranger		
		GREEN PINESTRATCOM	UHF radio communications		
		GREG	F-15s Williams AFB		
		GUCCI	March AFB KC-10s		
				NITRO	Castle AFB KC-135s
				NORSE	Grand Forks AFB B-1s 329th BW
				OGGY	T-38s Holloman AFB NM
				OMAHA	Customs aircraft used in DEA/Customs activities
				OMEGA	Possible callsign of TR-3As Black Mantas
				OUTCAST	Homestead AFB Army Ops

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PEDRO

PINION
PLEAD 13
POKER

POLE VAULTER
PRIME BEEF
PRIMO
PROTECTOR
PYOTE
PYRAMID
QUAIL
QUEEN
RACE
RANDY
RASPBERRY
RAT
RAVEN
RAWHIDE BASE
RAYGUN
RAYMOND 1
RAYMOND 6
RAYMOND 7
RAYMOND 8
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RAYMOND 28

F-16s Hill AFB
US Army Priority Air Transport
USN/USMC local-based rescue aircraft not engaged in SAR mission
Beale AFB TR-1s/U2s 9th SRW
MAS Point Mugu weather
McClellan AFB Helo Squadron-also Ellsworth AFB KC-135s
McClellan AFB Lark Squadron
USAFR 440th AW at General Mitchell Field
March AFB KC-10s
HC-1 North Island
Dyess AFB B-1s
Langley AFB 74th TCF
Hickam AFB 5649th Test Group C-130s
Elgin AFB Rescue Ops
F-16s 388th FW Hill AFB
F-14s Point Mugu
NAS prefix
USNR Reserve Air Transport C-118s C-131s
EF-111s Cannon AFB NM
Base USN VRC-40 Squadron at Norfolk VA
USN A-6s VA 55 (CVW-17)
Langley AFB
George AFB
Cannon AFB
Davis Monthan
Howard AFB Panama
Hurlburt Field 1st SOW
Eglin AFB
England AFB
Homestead AFB
Holloman 49th FW
Homestead AFB 31st FW
Langley AFB 1st FW/316 FS
Moody AFB 3047th FW
McDill AFB 56th FW
Patrick AFB
Myrtle Beach 345th FW
Nellis AFB 57th & 474th FW
Hill AFB
Tinker AFB 552nd AWACS Wing
Seymour-Johnson 4th FW
Shaw AFB 363rd FW
Mountain Home 366th & 622nd ACW
Bergstrom AFB 67th RW CP

READY
REESE
RENEGADE
RESCUE
RICK
RIDER
RINGMASTER
ROMA
ROOK
ROYAL CROWN
RUSHMORE CONTROL
SAINT
SAM
SAM 01
SAM 27000
SAMP
2
SAVE
SAWHORSE
SCHOOL BOY
SCOTTY
SCREAMING EAGLE
SEA HAWK
SEA LORD
SENTRY
SHADOW
AAF
SHAMU

SHIVA
SHOCKER CONTROL
SHOOTER
SIERRA PET
SILVERBOW
SILVERSTORM
SILKY
SKYKING
SKYBIRD
SKYLARK
SODA
SPAD

SPEAR
SPERM LAKE
SPIDER
SPAR

MacDill AFB
T-38s/AT-37s Reese AFB TX
VF-24 Miramar
Rescue aircraft engaged in SAR mission
KC-135s March AFB
Unknown stealth aircraft based near Holloman
NORAD HQ (Colorado Springs) old callsign
Griffis AFB KC-135Ws
NAS Whidbey Island aircraft
WHCA KY-58 switchboard
Ellsworth AFB SAC CP
VFC-13 Miramar NAS
Special Air Mission Aircraft (VIP aircraft)
Aircraft transporting visiting heads of state
Air Force One President not on board
STRATCOM hi-altitude air sampling recon aircraft U-2
ARRSH-1 locally-based helos not engaged in SAR
Vice President Al Gore
USS Midway
Seymour-Johnson AFB
VF-51 Miramar NAS
VF-125 Miramar NAS
NAS Jacksonville FACSAC
Tinker AFB 552nd AWACS Wing E2A aircraft
KC-10s Seymour Johnson AFB & A-6 & Amadec
at Sierra Ordnance Depot
USAFR KC-10s from Seymour-Johnson AFB & possibly TR-3A's
Eaker AFB B-52s
McClellan AFB SAC CP
F/A-18s El Toro MCAS
March AFB NORAD 26th ROCC
Tonopah Test Range Control
Groom Lake approach Nevada
KC-135s Dyess AFB Abilene, TX
General call to all STRATCOM SIOP forces
General call to any STRATCOM Ground Forces
Tipper Gore
TNANG 134th ARG KC-135s at McGhee-Tyson AFB
MN ANG 148th RG at Duluth-also reported as Langley
AFB 94th FS-also reported as Altus AFB KC-135s
F-117As 49 FW Holloman AFB, NM
Groom Lake CP
Hill AFB, VT
SAMs other than diplo (MAAG Navy etc.)

SPIDER
SPUD
SPUR

STALLION
STARFIGHTER
STASH
STORK
STOWAWAY CTL
STRIKE
SWEAT
SWIFT
TAN
TARAGON
THUNDER
THUD
TIGER

TONGA
TOP GUN
TOP HAND
TOPSOIL
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TRAILED
TRIBE
TROUT

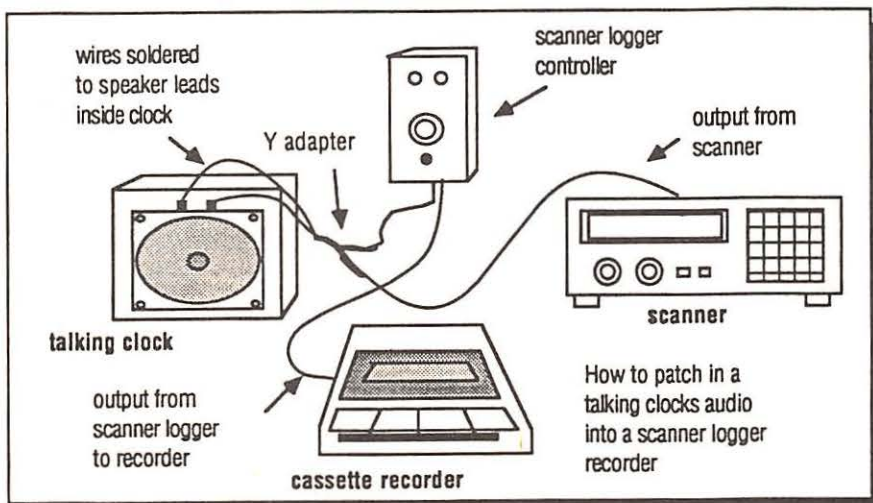
TUFF
TUG

TUNE
TURBO
UTAH
VADER
VALOR
YANKEE

YULE
ZOLTAR

ZOOM

F-16s 388th TFW Hill AFB
F-16s Hill AFB
USAFR 337th TAS/439th AWC-130s at Westover AFB
VF-302 Miramar NAS
NAS Oceana VA VF-33 F-14s
Luke AFB AZ
NAS Cecil Field KC-135s
South Weymouth NAS HSL-74 helo's
F-185 Yuma MCAS
SAM C-21 aircraft
VIP ferry aircraft
McClellan AFB tanker aircraft
Offutt AFB NE
George AFB-also MAU Moffett
F-16s Hill AFB
England AFB La Supv of Flyings-also Ellsworth AFB
B-1s-also HMS-361 Tustin NAS & RVAAH-1 Key West
T-38s Holloman AFB, NM
Fighter Weapons School
Norfolk Submarine Comm and Atlantic
McChord AFB NORAD Ops Center
USN Stockton Comm Sta-also NAVCOMSTA San Francisco CA
USAFR 928th TAG C-130s at Chicago
McClellan AFB Wichita Ks B-1Bs
McClellan AFB B-1 38th BW
Andrews AFB 4950th Test Wing Det 1 aircraft T-39s used by AFSC brass
Castle AFB B-52s 328th BS
Scott AFB 1401st MAS C-21As-also reported as 375th Aeromed Airlift Wing
F-16s Hill AFB
McClellan AFB KC-135s
KC-135 151st RFG Utah ANG
USAFR 910th TAG CP at Youngstown
T-38s Holloman AFB, NM
MA NG 26th INF Brigade Otis MA-also South Weymouth NAS VP-92 P-3s
WY ANG 153rd TAG at Cheyenne
Unknown stealth aircraft based near Holloman AFB NM heard flying with groups of three F-117s Fallon work area Ops



Talking Tape Logger

Always inventive, Elwood Johnston of Roswell, New Mexico, has come up with another nifty idea that monitors might want to try. Like a lot of monitors, Elwood uses a tape recorder and an automatic scanner logger to keep tabs on the action while he is away or asleep. The problem was that, without an expensive time indexing recorder, one never knows at what time the communications took place.

Elwood solved the problem by using an inexpensive voice synthesized "talking" clock. Elwood wired the clock's speaker output into the recorder's input (see graphic). Now when the clock chimes (or speaks) on the hour and half hour, it is recorded on the tape along with the scanner's audio. Although not perfect, this gives Elwood the general time when a communication occurred. I tried this project myself and it is easy to do and works great. Thanks for the tip!

MT

High Performance MW Loop Antenna



Air-core design - tunes 530 to 1700 kHz with variable bandwidth (2 kHz to 15 kHz), gear reduction for precise nulling of signals, liquid filled compass for bearing measurements and more!

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Welcome aboard for flight software, microburst simulation, and more!

Contest Winner!

A few months back, when we reviewed the book called *The Downing of Flight 6 Heavy*, it was noted that although the book was extremely well written and technically correct, the author left out one very vital aspect of transatlantic flying. So we decided to have a little contest to see if anyone else also spotted this omission.

While we had very good response from readers who tried to guess what it was, only David Wolf of Pennsylvania came close: The missing aspect of flying over the Atlantic was NY ARINC! While the author of the book did casually mention Gander Radio, he completely left out anything pertaining to NY ARINC and the vital role they play in transatlantic flight communications.

David guessed that it was the lack of SELCAL usage, and since this was as close as anyone came to the correct answer, he wins a copy of MIRAMAR, a military aero computer simulation. He wrote "While there was a brief mention of SELCAL early on in the book, once Flight Six Heavy was in the air, I didn't hear one mention of SELCAL or a SELCAL watch." He's one hundred percent correct! Congratulations, David!

Flying by Computer

I was really appalled at the Computer Pilots Association of America for their unbusiness-like practices, and the way they treated those readers who sent in money for their memberships. The good news is that I have been in touch with the Better Business Bureau of Metropolitan Houston, TX (where the CPAA is headquartered), and they are looking into the situation for us. I'll keep

you updated. If anyone has had a problem with the CPAA and hasn't contacted me already, please do so as soon as possible.

Those of us who are addicted to "flying by computer" can take heart in that there are other organizations around the country that can provide all the same material that CPAA claimed to—and more! In a very nice letter to *MT*, Nels Anderson of Massachusetts tells us of one called MicroWINGS. Membership information can be obtained by writing to: MicroWINGS, Inc., 381 Casa Linda Plaza, #154, Dallas, TX 75218. Their phone number is (214) 324-1406. Annual membership is \$49.00.

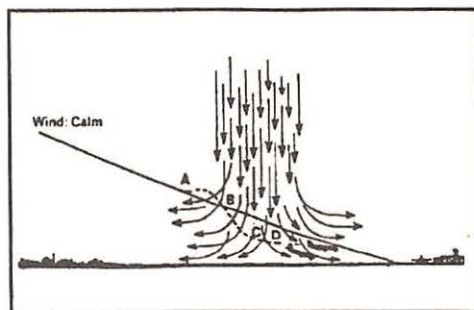
This organization was founded by Robert M. MacKay, author of *Pilot's Power Tools*, recently released by Mallard and available at most software shops. Mr. McKay has been an active member of the flight sim community for a long time.

Nels mentions that there are a number of BBSes around that specialize in flight simulations, with many, many related files plus message areas for sim fans. Matter of fact, one is even run by an FAA office! In addition, there are BBSes that carry the RelayNet flight sim message conference; also RelayNet has conferences for real life aviation and radio/scanning.

For those of you who are interested in the BBSes, Nels has provided us with two listings: one for the BBSes that specialize in Flight Simulators, and one for BBSes that carry RelayNet Flight Sim Conference. Just send me a business-size self-addressed stamped envelope in care of *MT*, specify which listing you want (or both of them) and I'll send it out to you.

Speaking of flying by computer, SubLOGIC, the company who has come up with products such as FLIGHT ASSIGNMENT ATP and the soon-to-be-released FLIGHT ASSIGNMENT AIR FORCE, has some new goodies on the market: USA EAST and USA WEST. These are extra-super scenery data bases containing all scenery, airports and radio nav aids east and west of the Mississippi, respectively. Each of these sells for \$69.95 and can be obtained directly from SubLOGIC at 501 Kenyon Road, Champaign, IL 61820. Their U.S. order line is (800) 637-4983, and their regular number for technical assistance is (217) 359-8482. They also have a FAX: (217) 352-1472.

Well, all I can say is that I'm going to have to try this out! Assignment ATP is one of the best and most realistic flying simulations I've come across and these new products will really put the icing on the cake.



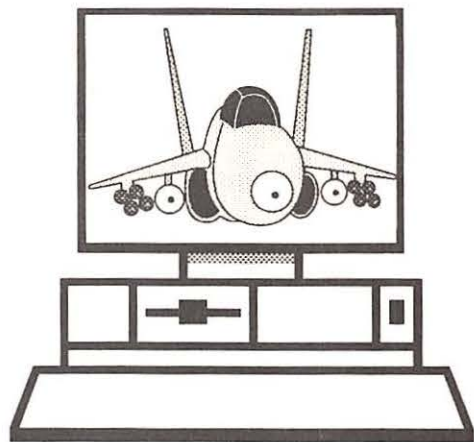
A Microburst Demonstration That You Can Try at Home!

A few months ago, we talked about windshear and microbursts and the devastating effect they can have on aircraft (December 1992). Now we're going to demonstrate how you can actually see part of a microburst in action! Here is a summary of our discussion concerning this form of windshear which is responsible for so many accidents to aircraft.

Microbursts are produced when a rain shower or thunderstorm creates a current of rapidly downward moving air—a downdraft—that spreads out horizontally in a starburst pattern when it strikes the ground. Once an aircraft hits a microburst, it encounters an increase in head winds radiating away from the center of the downdraft. This increase in head winds enhances the airflow over the plane's wings, causing the plane to pitch upward and forcing the pilot to compensate by reducing engine power. Then, as the aircraft passes through the downdraft center, the headwind rapidly decreases and becomes a tailwind, and the airflow over the wings suddenly falls off with a corresponding decrease in lift.

Any additional loss in airspeed caused by the pilot reducing engine power and/or the downdraft of air pushing the plane toward the ground contributes further to this hazardous situation. If the aircraft is too close to the ground when this happens, there may not be enough time for the pilot to react and for the engines to regain sufficient power to compensate for the loss in airspeed.

What we are going to show you, in this simple demonstration, is how the downdraft portion of the microburst affects an aircraft by using a common everyday housefly as a stand-in for an aircraft. First of all, you need a fly swatter—and a fly. At this time of year, there shouldn't be any problem in finding an abundance of these pesky critters.



As you start to swat the fly, your luck in actually hitting it, believe it or not, depends on the way it's facing. If it's facing **away** from you and tries to fly away as you lower the fly swatter, the draft will force him upward and it'll be able to fly safely away. However, if it's facing **toward** you, the downdraft of the fly swatter will cause him to **stall** out as it tries to fly away and, consequently, your chance of hitting the little bugger improves almost one hundred percent.

However, if the fly has a white face (as in the 1958 original movie version of *The Fly*), he'll already have figured this out for himself and won't be easily swatted!

Thanks to Dale Spurgeon for this idea. Incidentally, we tried it for ourselves and it works!

Readers' Corner



• In the April column we featured a story about Richard Levenson and the electronic map he devised to track aero traffic over the Atlantic. From the mail we received, this project obviously captured many readers' imagination. For those of you who would be interested in contacting Richard, he has given me permission to print his address here in the column, as follows: 14 Sandpiper Road, Manalapan, NJ 07726

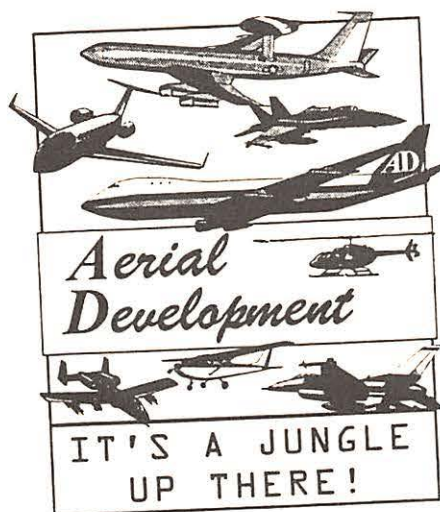
• Mitchell Prax of Victoria, Australia, via Bill Battles (NH), has sent us information regarding OTC SKYCOMS, an Australian-based company whose logo reads "Complete in-flight com-

munications for the world on HF." Obviously, in this category, they perform a function similar to ARINC's LDOC services in that they provide phone patches, SELCAL paging, and other functions. Their HF voice frequencies are 5160, 8140, and 11132 kHz. Either due to excellent propagation conditions, or a lucky fluke, they have been monitored in North America on occasion. Their many customers include international airlines, corporate, and general aviation aircraft. Other services they provide are Skygrams and Autocall availability.

Speaking of Bill Battles, his excellent guide to air carrier radio call signs/worldwide aero HF monitoring book is still available. This is one book that no aero monitor should be without, as it tells the reader who all those odd callsigns they hear on the air belong to. In addition, there are sections on monitoring the HF bands, frequencies, addresses, and more. Write to Bill at W.J. Battles Enterprises, P.O. Box 133, East Kingston, NH 03827 for more information about the *World Air Carrier Radio Callsign Directory*.

• Several times over the past few years in this column, we've stated that there are various maps and charts that can enhance the hobby of aero monitoring and have suggested several different places where you can buy them.

However, now there is a one-stop shopping place for all of the various aero maps and charts that you need. It's called **Aerial Development**



Computer Aided Scanning

a new dimension in communications from Datametrics



Now Radio Shack PRO 2006

owners for the first time have access to the exciting world of

Computer Aided Scanning with the highly acclaimed

Datametrics Communications Manager system. Computer Aided Scanning is as significant as the digital scanner was five years ago and is changing the way people think about radio communications.

The Datametrics Communications Manager provides computer control over the Radio Shack PRO2006 receiver. Comprehensive manual includes step by step instructions, screen displays, and reference information.

Powerful menu driven software includes full monitoring display, digital spectrum analyzer and system editor. Extends receiver capabilities including autolog recording facilities, 1000 channel capacity per file, and much more.

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Datametrics, Inc

Computer Aided Scanning system \$349

PRO2006 receiver w/interface installed and CAS system \$749

Manual and demo disk \$15

Requires Radio Shack PRO 2006 receiver and IBM PC with 360K memory (640K for full channel capacity) and parallel (printer) port.

Send check or money order to Datametrics, Inc., 2575 South Bayshore Dr, Suite 8A, Coconut Grove, FL 33133. 30 day return privileges apply.

of New England. Their address is P.O. Box 661, Bangor, ME 04402-3961; telephone number is (207) 945-3961.

After examining a thorough sampling of their products, I have to say that they have the most complete line of charts, maps, and manuals for us monitors of any place I've seen to date. Prices are extremely reasonable, and whether your interest in aero monitoring is in just one locale or worldwide, they have just the chart or map that you need for both military and civilian monitoring. The main reason that ADNE's stock is so complete is that the company is run by people who are monitors themselves and who can understand and anticipate the needs of experienced listeners as well as those who are new to our hobby.

Included with all purchases as a quick introduction to the subject is a guide called "Monitor's Notes," which explains how to use the map or chart in each order. These are also available separately; contact the ADNE, attn: Andy Marshall for more information.

That's all for now. Next time we'll talk about reception reports, list some airline addresses, and other subjects. Don't forget to keep sending in airline company frequencies from your area as well as anything else you'd like to see appearing in the column.

Until then, 73 and out!

MT

Focus on the 5th District

With roughly 200 active sites, the Coast Guard is second only to the FAA in the number of U.S.-based beacons. This month we'll take a look at those of the mid-Atlantic District of the USCG.

I chose the 5th District because its waters are among the busiest of all Coast Guard jurisdictions, being shared by recreational, commercial, and military vessels. Also, the beacons of the 5th District have undergone significant changes under the 1987 Radiobeacon Modernization Plan, which I'll discuss shortly.

The 5th District encompasses the East Coast waters from near Toms River, NJ, to the border of South Carolina. This includes the Delaware and Chesapeake Bays, inland waterways, and waters offshore. A network of 14 radiobeacons provide coverage of the area as shown in Figure 1.

The official range for beacons in this area varies from as little as 10 miles to as far as 125 miles depending on output power. These are the nominal ranges at which mariners can count on getting good, usable signals. For the DXer, of course, the limits could be stretched to at least four times the listed ranges—provided you're willing to put up with the usual noise and competing signals. In general, if you live anywhere east of the Mississippi, these beacons would be worth a try when conditions are right.

The Coast Guard's Radiobeacon Modernization Plan calls for elimination of sequenced beacons by converting them to continuous operation, relocation of beacons which are difficult to maintain or costly to operate, adjustments to the service range where required, and the addition of Global Positioning System (GPS) correction signals at some high power sites. The ultimate goal of the plan is to provide a more reliable, cost effective network of beacons.

In accordance with the plan, all beacons in the 5th District now operate in continuous mode, and two sites have GPS equipment installed: HL (298 kHz), and CB (289 kHz). A new beacon had

been tentatively planned for Assateague, VA, on 303 kHz, but it is not on the air at this writing. With respect to the GPS sites, beacon characteristics should remain unchanged, other than a slight warble on the Morse ID tone as a result of the 100 baud correction data.

There are two other beacons in the District which are not shown on the map, and may not be on the air at all times. These are Coast Guard test/evaluation stations used primarily for checking beacon equipment (GPS correction gear, for instance). They are: XO (305 kHz) in Alexandria, VA, and X (301 kHz) in Wildwood, NJ.

If you'd like additional resources for DXing the area, you may want to obtain the official "Light List" for the area, which is available for purchase from the Government Printing Office. The Light List shows the locations and characteristics of all aids to navigation, including LF radiobeacons. Volume 11 covers the waterways of the 5th District (stock number 050-012-00304-1). For ordering information, write the Superintendent of Documents, U.S. Government Printing Office, Attn.: Customer Service, Washington, DC 20402.

Traditionally, the Coast Guard has been very good about returning Prepared Form QSL Cards (PFCS) when they are accompanied by proper return postage. If you wish to send your reception report of a beacon in the 5th District, the address is: Commander, 5th Coast Guard Dist(Office of Aids to Navigation), 431 Crawford Street, Portsmouth, VA 237045004.

Mailbag

• Bob Sullenberger of Venice, FL, shows just what can be accomplished with a modest receiving setup and a little persistence. Sadly, his community forbids outdoor antennas of any kind, so he mounted a Sony AN-1 active antenna inside his attic at the highest peak. Judging by his loggings, the arrangement must be working well.

Thanks to Bob, we do have one mystery to pass along. He logged a beacon sending "M" at 485 kHz. After searching my database of both foreign and domestic beacons, I've come up blank. If any readers would like to take a stab at this one, we welcome all guesses. As always, you can reach me by writing to *Below 500 kHz c/o Monitoring Times*.

• Don Tomkinson (Huntington Beach, CA), wrote to say that NZJ (410 kHz) is back on the air from Santa Ana, CA. It had been off for about seven months

Table 1: Reader Loggings

FREQ	ID	LOCATION	BY
21.4	NSS	Annapolis, MD	T.K.
22.3	NWC	Australia	T.K.
24.0	NAA	Cutler, ME	T.K.
24.8	NLK	Jim Creek, WA	T.K.
198	DIW	Dixon, NC	B.S.
216	CLB	Wilmington, NC	B.S.
227	TAN	Taunton, MA	B.F.
232	RZP	Provincetown, MA	B.F.
257	FFF	Plymouth, MA	B.F.
275	FPR	Ft. Pierce, FL	B.S.
288	NCE	Portsmouth, NH	B.F.
313	Z	Cape Canaveral, FL	B.S.
339	A	Havana, Cuba	B.S.
396	ZBB	Bimini, Bahamas	B.S.

and he thought it was gone for good. He notes, however that the El Toro military base in Orange County is slated for shutdown in 1995, and since NZJ serves the base airfield, its long term status is still shaky.

For some time now Don has also been hearing Mexican beacon ENS (400 kHz), but could find no record of it on the current charts. After checking the latest Updater for the *AerolMarine Beacon Guide*, I found this new beacon listed as being in Ensenada, Mexico. It supports military and civilian aviation in that area, and operates with a standard 1020 Hz ID tone.

On some occasions, Don hears the ENS identifier being sent out as "ENS-E." At first, it may appear that this is an ID malfunction, but more likely, it indicates that a reserve transmitter has been activated. Many beacons have a provision for automatically switching over to a backup transmitter if the primary unit should fail. When switchover occurs, an "E" is appended to the Morse ID to alert maintenance personnel.

Loggings

I'd like to thank Bob Fraser (MA), Bob Sullenberger (FL), and Terry Krey (TX) for supplying this month's loggings. They are identified by their initials in Table 1.

End Notes

Uncle Skip related a story to me at last year's MT Convention that I think is worth repeating. It seems Skip was once rummaging through some old radio parts being thrown out in his neighborhood, when the homeowner, an SWL, invited him in to see his shack. Once inside, Skip found this fellow actively hunting beacons and keeping detailed lists of his catches. The kicker is, the fellow had no idea that there was a whole hobby of DXing beacons—he was just making his own hobby! Skip gave him some literature on beacons and he was off and running with renewed enthusiasm.

The moral here is: Why not share the longwave hobby with someone who's never been below 500 kHz? It's a refreshing change from the usual fare and just might open a new door of listening fun.

See you in September.

MT

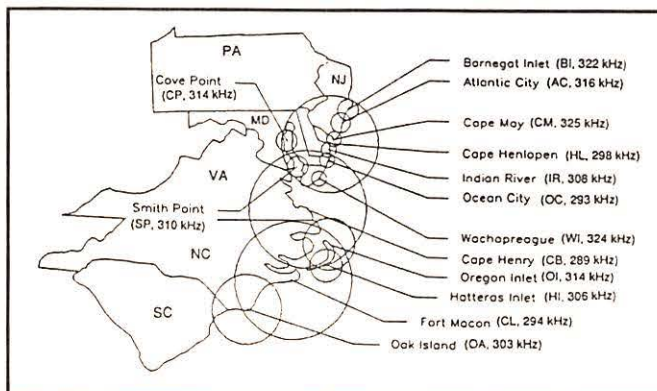


Figure 1: Beacon coverage areas of the 5th District. (Adapted from 1992 Special Notice to Mariners, 5th USCG District)



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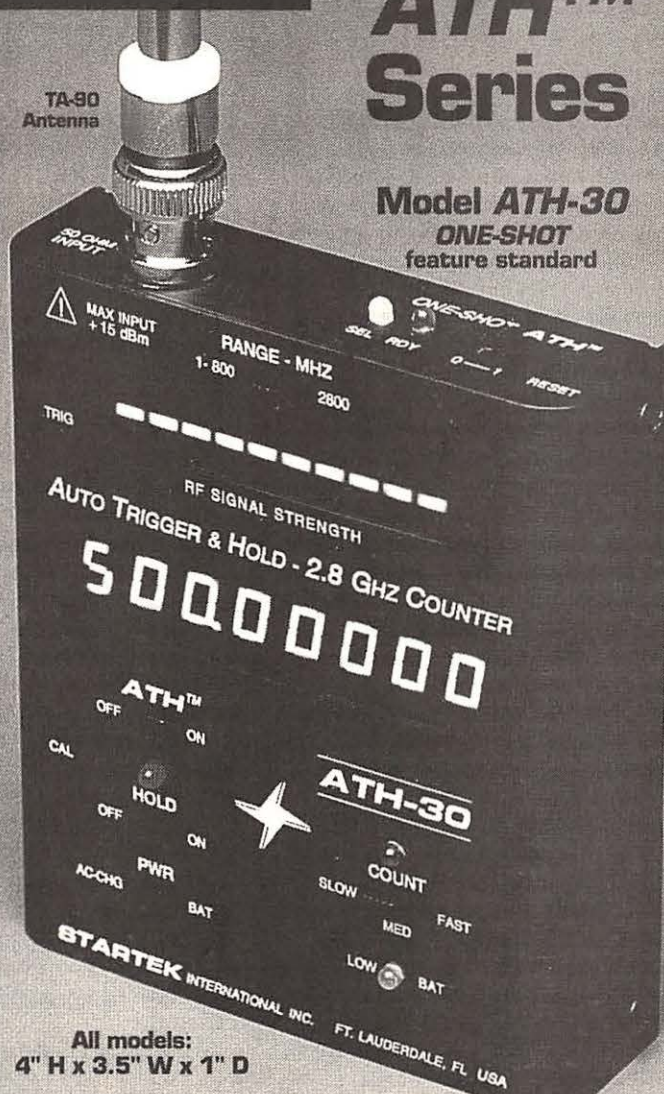
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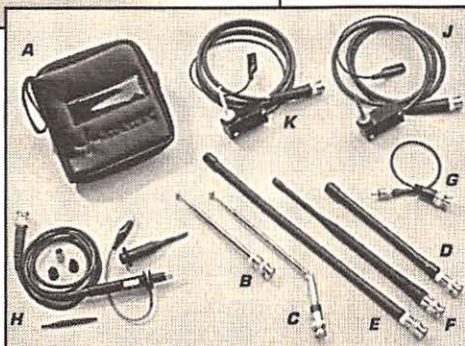
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Accessories	
A CC-90 Case for all models	12.
B TA-90 Telescope BNC antenna	12.
C TA-90-L Telescope elbow antenna	16.
D RD-150 150 MHZ rubber duck	16.
E RD-2750 27-50 MHZ rubber duck	28.
F RD-800 800 MHZ rubber duck	29.
G M-207-IC Interface cable for MFJ-207	10.
H P-110 200 MHZ, 1x, 10x probe	39.
J LP-22 Lo-Pass, audio usage probe	25.
K DC-10 Direct, 50 OHM probe	20.



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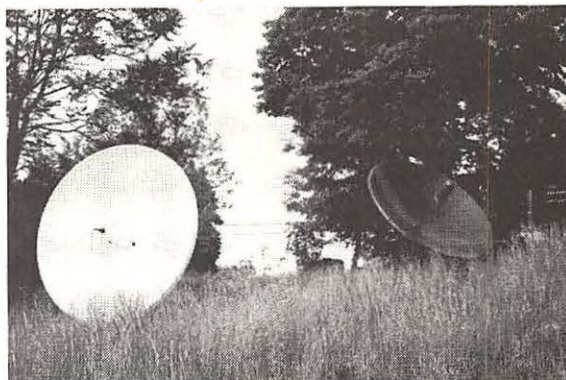
Computers are invading the world of radio! Take a tour of your local station, and all you may find is a PC and a satellite receiver. Music, talk shows, and the voices of the disk jockies now arrive from studios thousands of miles away. Jingles and local spots are recorded digitally, eliminating the need for magnetic tape. Turntables, cart machines, audio consoles, and even microphones are being retired as obsolete hardware. Human presence is limited to a small management and sales staff. Welcome to radio in the 21st century!

Necessity has changed the business of broadcasting. Station owners have suffered the effects of a difficult economy for years. Advertising dollars are hard to find, and the costs of employing a staff have skyrocketed. In many markets, hiring a live local personality to host a morning drive-time show is considered a luxury. To maintain a competitive air sound and still turn a profit presents quite a challenge!

Technology has come to the rescue! During the past ten years, personal computers and satellite earth stations have been improved and refined into affordable user-friendly devices. Station operators can now sit back and purchase complete programming packages that will fill their air time 24 hours a day. Sophisticated computer programs insert local commercials and announcements into satellite-delivered formats creating a completely automated air sound. Listeners, hopefully, won't perceive the difference. If you tune around the dials and hear the same song playing simultaneously on more than one station, especially on the AM band, you're listening to satellite-delivered automated radio!

Here is the philosophy of a computer-age station owner: For as little as \$500 a month, you can subscribe to a programming service that provides everything necessary to fill a broadcast day. Music, talk shows, news, and sports, all arrive via satellite. Listeners enjoy the talents of announcers that only major stations in big markets can afford. Custom prerecorded announcements, mentioning individual stations,

*Meet the
overnight air
staff at
WHVW—news
dish on left,
music dish on
right.*



are blended with live generic patter creating a seamless delivery.

Listen carefully to your local station! A satellite-delivered song ends. A cue pulse, sent from the studios of the programming syndicator, is received by a pulse decoder at the broadcasting station. The decoder, in turn, starts the playback of an announcement on the local station's hard drive or Digicart machine: "The home of real country for The Hudson Valley is WHVW!" The announcer in Dallas, Texas, immediately jumps in with a live voice: "Here's Mary-Chapin Carpenter..." and a compact disk begins to play to the entire network. Other cue pulses can start local commercials, jingles, and promotional announcements. Each segment is precisely timed allowing perfect cutaways and rejoins to the syndicated programming nationwide. The result sounds remarkably local, yet no one is closer than 2,000 miles away!

There are some added benefits of computer based radio. Every event that hits the air is logged, second by second, creating a very accurate record of what went on the air. Advertisers receive precise documentation of when their spots aired, and are automatically billed via the station's master computer system. The fees due for music rights to ASCAP and BMI no longer require guesswork. The computer completes all the work previously done by accounting and traffic department staff, resulting in huge savings to station owners. Payrolls also emerge automatically from these advanced systems.

Technical aspects of radio stations can also be handled by computers. Almost all studio equipment can be eliminated. Transmitters can become computer controlled and monitored according to specification. Computers can even alert the chief engineer, via a phone call, when transmitters deviate from normal parameters. AM stations that require changes in power or directional pattern during the day can rely on the same computer for accurate implementation.

Dozens of companies are marketing master computer systems to radio stations around the

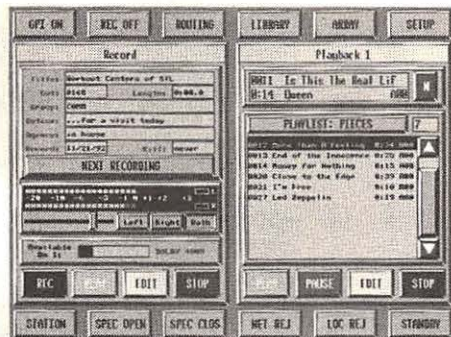
world. One of the most advanced configurations, "The Ultimate Digital Studio," was developed by TM Century, a major provider of jingles and production music. Their UDS system allows either full automation of a station, or a live-assist mode. In live-assist, a local disk jockey sits back and monitors a computer screen that will prompt him when to talk. When he is done announcing, he hits a button that ends his event and returns control to the computer.

Events can be added or subtracted from the program by entering the changes via the computer keyboard. The air talent can also record all the necessary announcements for a future show into the computer in one sitting, instead of performing them live. Voices necessary for a complete air shift can be loaded in a few minutes, freeing the announcer to double as a sales person or a news reporter. The computer will recall the prerecorded announcements at the proper time.

A UDS can also create a custom music format, using up to seven Sony CD machines, right in the local station's studio. These multiple disc players can be loaded with 60 discs apiece, for a total of 420 disks, containing thousands of songs! Resourceful music directors could program weeks of music from a library this size! Old analog devices, like cart machines and reel-to-reel tape recorders, can be included in a UDS system, as well.

Recording audio into a computer offers very clean reproduction and nearly flawless operation. Some manufacturers tout their systems as being even more reliable and robust than a compact disc. Computer hard drives require less mechanical parts than CD players, and very rarely fail.

Digital audio work stations are rapidly replacing analog production studios that used reel-to-reel tape machines and audio consoles. Editing by cutting magnetic tape with a razor blade is a thing of the past. Most work stations employ Apple Macintosh computer programs that allow editors to actually see a visual representation of the recorded sound waves that can



Be an American BandScan Reporter.

See any stories about radio in the local paper? Send them to *Monitoring Times*, PO Box 98, Brasstown, NC 28902.

be edited and faded with a computer mouse. Small stations with limited budgets are replacing their continuous-loop tape cartridge recorders with digital cart machines. Working in a digital domain, the results are noise-free and can be altered or revised without risk of damaging original materials.

Replacing local radio programming with satellite-delivered computer-driven formats will change the personality of what you hear forever. The charm of a local announcer that you may recognize at community events may go the way of the long-playing vinyl record. Local radio stations may stay on the air, but will you enjoy the sound of anonymous voices from far away as much as a disc jockey that has become a household word over the years? Will computer technology create a world of super-jocks that the entire nation will recognize? Tune in ten years from now and find out! Until then, keep your eyes on the sky and your fingers on that keyboard!

Bits 'N' Pieces

Marketing mavens at Spokane, Washington's Channel 6, KHQ-TV, cleverly maximized their station's potential. A new advertising campaign boasts that you can now hear KHQ-FM in your car or anytime you are away from your TV! Listeners are actually tuning in to the audio carrier of Channel 6 at 87.75 MHz. Most analog radios can tune far enough to the left to capture Channel 6 audio, and some digital tuners extend to 87.7 as well. KHQ-TV hopes ratings of their local newscasts will benefit from this fluke of adjacency.

Channel 6 KBJR-TV, serving Superior, Wisconsin and Duluth, Minnesota also promotes their station as a FM simulcaster. A tip to summertime TV DXers: Roll an audio tape on 87.75 MHz when tropo and E-skip conditions exist and review the tape after the opening has passed. It's like having a second TV to DX with!

Mailbag

Beantown's biggie, WBZ, is the subject of a fascinating letter from *MT* reader Bob Fraser from Cohasset, Massachusetts. Bob recently visited the WBZ transmitter site at Nantasket Beach and sent along a brief history of the 50,000 watt station on 1030 kHz:

"WBZ, a Westinghouse Group station, started up at Springfield, Massachusetts, in September of 1922. In fact, the original towers are still on the Westinghouse factory there. It was, as I understand, the first U.S. station with commercial call letters instead of amateur experimental radio call letters. Because of poor reception in Boston, a subsidiary station, WBZA, was built at the state capital. For the first few years, the programs were not synchronized. I believe WBZA

was built in downtown Boston around 1925, and synchronized programming began in 1927.

"By 1930, a new transmitter was built outside of Boston at

Millis. At this time, the Boston station had become the most important, so the call letters were switched to WBZ, Boston, and WBZA, Springfield. Both were a part of the NBC Red Network.

"However, the 10 kilowatt Millis transmitter turned out to be disappointing. A piece of salt marsh was found on Nantasket Beach, and a 50 kilowatt transmitter was built there in 1940. WBZ's twin towers are 512 feet high and were designed for maximum signal on 990 kHz. The next summer, the AM band was expanded and WBZ moved to its present 1030 kHz. In the meantime, WBZA, Springfield, became less and less important, was reduced to 1000 watts, and in the 1960's, went off the air.

"The telephone poles near the AM towers are actually 50 foot high wooden poles which once held rhomboid antennas for the shortwave station here. There were two rhomboids: one beam to Europe, and one aimed at Latin America. WBZ, Springfield, also had a shortwave outlet, 1XK, but this was for point to point transmission only. KDKA, Pittsburgh, the Westinghouse flagship station, had a shortwave outlet, 8XS, used not only for point to point, but also to relay programs of KDKA. In 1939, its call became WPIT. However, their engineers found its signal was not all that great, so when WBZ was built on Nantasket Beach, the equipment of shortwave WPIT was moved to the same site and became WBOS.

"During World War II, its programs were censored so often that it was handed over to the U.S. Government. It was returned to Westinghouse late in 1945 and continued on until 1950. Its equipment was then sold to WRUL (later WNYW and WYFR), which broadcast from Scituate, a few miles down the coast.



Bob Fraser

The WBZ transmitter house and twin towers at Nantasket Beach—note the steel dish antenna mounted by the chimney.

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Dealers Welcome

"Streeter Stuart, a now retired WBZ personality, said on one of the WBZ anniversary programs that he started at the station as an announcer on WBOS shortwave. He recalled that one of the items the station distributed were postcard photos of Hollywood stars. They were extremely popular, especially in Spain, which was just recovering from the horrors of their civil war." Thank you, Bob, for a wonderful history lesson!

International Bandscan

The dials are bursting in Bangkok! You'll find 41 FM and 35 AM stations to choose from, with over 400 stations nationwide. Look for English broadcasts on The Voice of Free Asia, 1575 kHz, daily from 2200 to 2230 local time. Classical music is broadcast from Chulalongkorn University at 101.5 MHz FM from 9:30 pm until midnight. On 95.5 MHz, you'll find the hits of the 70s and 80s on Gold FM starting at 6 am each morning. At 10:00, they switch gears and become The Jazz Connection until sign off at 2 am. Also enjoy Smooth 105 FM, Bangkok's easy-listening station also on the air from 6am to 2am featuring "international DJs." You'll also find English soundtracks for Bangkok's television stations on the FM band: Channel 3 is translated on 105.5 MHz, Channel 7 on 103.5 MHz, Channel 9 on 107 MHz, and Channel 11 on 88 MHz.

Until next month, enjoy the summer and happy trails!

MT

Radio Sweden's TVRO Guide

Most avid shortwave listeners are familiar with the programming found on Radio Sweden's shortwave service. European satellite and cable viewers have been enjoying this same service in FM audio quality for some time. Radio Sweden is truly an international broadcaster keeping up with the times.

It should come as no surprise that Radio Sweden has made available a publication which no TVRO monitor should be without. The publication is called *The DXers Guide To The Galaxy* and is written by George Wood, Radio Sweden's DX editor. This 50 page, 5-1/2 x 8-1/2", softbound book is simply stuffed with interesting information on every type of satellite in every region of the globe. The edition I received was published in February of this year.

The book is divided into five parts following a laudably succinct introduction to satellites. The first part is called "Satellite Broadcasting-TVRO." It is filled with handy little reference charts such as the actual downlink frequencies for North American C and Ku band satellites as well as operating frequencies for the S, C, Ku, DBS Ku, and Ka bands. Thumbnail sketches of each of our satellites is given, paying special attention to aspects of interest to TVRO enthusiasts. Information on location and frequency of many of the analog FM subcarriers is listed, as well as other nonvideo channels.

Contents of the Guide

Part One also lists the European satellites in enough detail for those of us on the west bank of the Atlantic to know just what we're missing. Astra, Eutelsat, Intelsat, PanAmSat, and the

Russian satellites are all given good accounting, too. A list of 28 FM subcarriers found on the Astra satellites is printed including many international broadcasters familiar to American SWLers.

If that didn't whet your appetite, this section also sketches satellite activities in Latin America, the Middle East, Africa, Asia and the Pacific.

Part Two is called "Weather And Other 'Utility' Satellites." It outlines, as briefly as possible, details of weather facsimile (WEFAX) satellites.

Part Three of the *DXers Guide* is a concise description of the Amateur Radio Satellite Service including a list of all the AmSats, their orbits, downlink frequencies and modes. Tips on monitoring the Space Shuttle, MIR, and military communications satellites round out this short, but informative section.

Part Four is a brief glance at the future and a detailed directory of where interested readers may go for more information. An impressive list of books, periodicals and other publications, electronic bulletin boards, computer services, and amateur radio nets on the subject of satellites wraps up this useful publication.

The Bottom Line

This is not the only publication you will ever need on the subject of TVRO unless your interest is purely a passing one. *The Guide* does not have any pictures, diagrams or fancy satellite footprint charts. You may refer to Part Four to obtain that kind of detailed information. *The DXers Guide to the Galaxy* is an introduction to the subject, and it does so extremely well.

The best part about this book is that it is free. To get your copy simply write to Radio Sweden, S-105 10 Stockholm, Sweden. When you receive your copy you'll also get a little pamphlet on Radio Sweden with the latest shortwave broadcast schedule, tips on QSLing Radio Sweden including a reception report form and an order blank for Radio Sweden T-shirts!

Radio Sweden is also transmitted on satellite. For those lucky enough to be near the Astra satellite (19.2 degree East) footprint, Radio Sweden is found at 11.597 GHz (Sky Movies Gold) Audio 7.74 MHz or on Tele-X (5 degrees East) at 12.207 GHz (TV 4) Audio 7.38 MHz.

Transponder Notes

Tom Taylor writes a column for the monthly trade journal *The Transponder*. His column, called "The Other Side of the Arc," deals with reception of satellites east of Spacenet 2 (69 degrees W). In his June 1993 column he talks about receiving Intelsat 513 (53 degrees W) on which the BBC is said to be found on channel 16 with audio on

6.6 MHz. He relates that he has "...a very good picture" using Uniden's President receiver on a 12 foot dish, and a "usable picture" with a 6 foot dish and 35 degree LNB. Using a 23 foot dish and a Monterey receiver he says he has an excellent picture.

Tom writes in his column that reception of 513 has been achieved as far west as California. He also suggests trying PanAmSat (43 degrees W) which has a number of interesting channels currently operating.

Those seeking less strenuous attempts at receiving BBC newscasts may tune to Galaxy 7 (91 degrees W) channel 23 at 6:00 PET for the BBC Nightly News. It is in the PAL format so it will be necessary to adjust the vertical hold knob on your TV to stop the picture from rolling. The pictures will still be black and white and appear to be elongated, thanks to the extra 100 lines of resolution in the PAL format over our NTSC standard. The audio will be unaffected.

PBS Plans

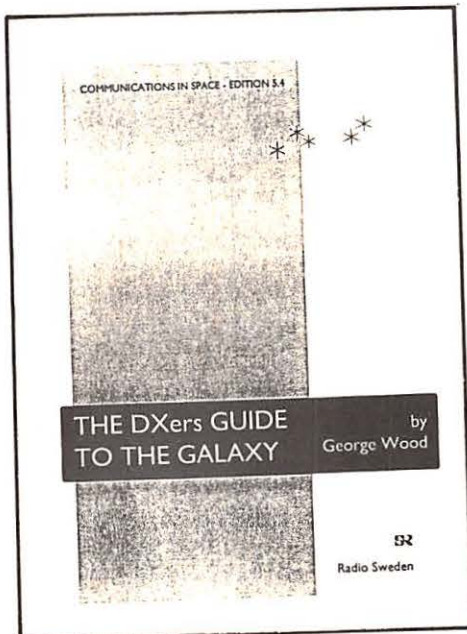
According to a report in the June 1993 issue of *TVRO Dealer*, PBS will maintain only one analog channel when it moves to its new satellite, Telstar 401, scheduled for a November launch. That channel will be on the C band side of the bird with its main activities happening on six compressed channels on the Ku side. The report also says we may look for SCOLA to have a new home on T401. Telstar 401 is slated for 97 degrees West replacing Telstar 301 at 96 degrees West.

Galaxy 4 Still No Go

The much awaited launch of Hughes Communication's Galaxy 4 satellite continues to be held for technical reasons related to the launch vehicle. Once launched, G4 will move to 99 degrees West and replace Galaxy 6 and SBS 6 at that orbital slot. Being a combination C and Ku satellite, G4 will help free up a space in orbit by taking the place of the two older satellites. SCPC reception enthusiasts will rejoice in the move as all the current SCPC residents now on G6 will switch to the higher powered G4. Decent SCPC reception should be possible with a good LNB and a dish as small as 4 feet. As soon as the bird is launched, I'll do some listening on my small experimental dish and report the results in this column.

Sidestepping the DBS Con Men

If you've been watching the news lately you've noticed a certain frenzy surrounding the



idea of cable companies offering hundreds of channels delivered by fiber optics, telephone companies poised to do the same, other independent entrepreneurs claiming they'll deliver the same goods via tiny dish Direct Broadcast Satellites.

There probably isn't a public relations firm in this country that's not working on some scheme to wow consumers with digital television, digital audio, home shopping from your computer keyboard, and more.

It costs tens of millions of dollars to actually set up and run such enterprises but it costs hardly anything to hire a PR firm to get up and whoop and holler about what they hope to do in the future. So it is that many consumers are being courted by the legitimate and the not-so-legitimate players in this gold rush down the electronic superhighway.

If you are truly interested in getting in on the ground floor of these new technology companies you will be best advised to take a cautious attitude. There are more than a few so-called new technology companies which are little more than Ponzi schemes or, at best, pyramid sales schemes which do a lot of selling but very little delivering.

If you have any doubt about the legitimacy of the company that's asking you to get in on the ride of your life, do the following: Get as much information on paper that you can. Take all proposals to a reputable financial advisor or stock broker. These certified and trained specialists will have access to industry information you may not. A few phone calls or checks with reference sources from legitimate financial institutions can keep you and your money from being parted. Above all, the old adage about going to Las Vegas to gamble holds here as well: Never put in more than you're prepared to lose.

MAILBAG

• My thanks to Rob Cave of Princeton, TX, for an interesting assortment of articles gleaned from some of the periodicals he receives. Included was an ad for a complete Ku satellite receiving system for just under \$400. There are lots of good satellite buys, especially in the used or surplus market for those willing to do a little digging.

• Also thanks to a reader from Fort Lauderdale, FL, for the piece on a mobile satellite telephone link for small boats. Equipment includes a 2 foot diameter satellite antenna, and a

transceiver said to be about the size of a VCR. Future versions will include fax and computer links as well as voice. Price runs about \$25,000, so you may not consider it for your canoe but it would look real sharp on your 35 foot twin engine diesel rig.

• Al Phillips of Keremeos, BC, Canada, would like a table of the latest GOES Weather Satellites and their locations. Table 1 is the chart as originally provided by NOAA and republished in *WetherSat Ink, The Environmental Satellite Applications Journal* from the Second Quarter 1993 edition.

Thanks to all who have written who have not been mentioned. Your contributions are greatly appreciated. What have you seen or heard lately with your satellite gear? Have you tried moving your dish beyond Spacenet 2 to the East? If you have an 18" actuator motor you may find that your limit is S2. Twenty-four inch motor arms can often be retrofitted to an existing motor drive.

If you are planning to buy a system in the near future, you may wish to include a longer drive arm for future satellite DXing. The extra few dollars will be well worth the effort. Those with heavy fiberglass dishes will be advised that their motors may not be able to pull the dish back from the extreme easterly look angle. If your motor blows a fuse or struggles to move the dish, you may actually have to help by lifting up on the dish as it moves back to the West. But be careful; working around a motorized dish in action can be extremely dangerous.

M
T

GEOSTATIONARY SUMMARY

	(Prime)		(West)		
	GOES-7	GOES-6	GOES-3	GOES-2	MET-3
Position	112.354	93.078	175.617	135.781	74.314
Drift Rate	0.007W	0.182E	0.045W	0.018W	0.065E
Fuel Remaining	20.981	0.000	6.260	10.180	23.479
Inclination	0.497	4.600	9.167	10.264	0.676
Spin Rate	100.004	102.911	100.570	99.875	99.930

Table 1

Touch-Tone Decoder Display



From
MoTron Electronics

The **Tone-Master™** Line of Hand Held Tone Decoder Display Products. Decode Touch-Tones from a telephone, scanner, tape recorder, or nearly any audio source.



- ✓ 16 digit LCD display with 80 character scrollable memory
- ✓ Portable 9 volt battery or external power operation
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Good Rigs at Low Cost!

Most of us stay on the lookout for reasonably priced equipment: of course, we want decent performance, too. At a recent hamfest I managed to get a good view of the **A&A QRP CW transceiver** kit. Top quality components are used throughout the kit. The entire assembled unit weighs only 27 ounces and is 100 percent complete, nothing else to buy. You get the cabinet, knobs and drives: all connectors, meter, key and earphone plugs are included in case your key or phones do not have the correct size of plug. Instructions are very complete and easy to follow.

This little unit has one feature that sets it above almost all of the other kits on the market, and that is a good crystal filter which insures reliable single signal reception. The transmitter features five watts of power, an extremely stable VFO and semi-QSK (break in keying). The kit is available for 40, 30 or 20 meter operation (specify desired band when ordering). The price is \$159.95 plus shipping (\$5.00 in US). This excellent little rig is available from ARW Amateur Radio Works, PO Box 8029, Youngstown, Ohio 44505-8029 (ask for their catalog).

C.M. Howes Kits

For the amateur interested in a high quality SSB/CW rig, let me suggest C.M. Howes, which at present offers two kits. One covers 10 and 15 meters with variable output power of 0.5 to 10 watts; the other covers 160 and 80 meters with the same output power. An advanced direct conversion receiver assures excellent sensitivity, stability and selectivity.

The 10/15 meter rig is SSB/CW while the 160/80 rig is DSB/CW. The difference between SSB and DSB is that the DSB rig transmits both sidebands (no carrier) while the SSB rig transmits only one sideband (no carrier). DSB is as effective as SSB, but, predictably, does consume more spectrum since both sidebands are present.

If you are a beginner at kit building, I suggest you enlist the help of a more advanced friend. These kits are not difficult to assemble, but as with any kit of this complexity it is necessary to follow instructions carefully.



This HW-100 hamfest bargain works great!

The 10 and 15 meter kit is priced at \$299.95 while the 160/80 meter unit is \$239.95 plus shipping. Both are available from Townsend Electronics, Box 415, 133 N. 1st St., Pierceton, IN 46562. Ask for their catalog, as Townsend handles many other kits in addition to the two mentioned.

Hamfests

Recently, a local amateur attended a hamfest and found the rig of his dreams (or perhaps his nightmares). After being assured the unit worked just fine (even though the particular brand has not been manufactured for over ten years), our new ham purchased it at a price of \$200. Upon getting the rig home and attempting to operate it, he found it did not work as claimed; in fact, it did not work at all, and most likely never will without expensive repair work being done. Unfortunately, the victim did not obtain the seller's name or call; therefore this chap is out 200 bucks.

Avoid becoming a victim by following these simple rules:

1. Take a more experienced ham along with you if you are serious about purchasing used gear at a hamfest.
2. Always ask for a demonstration of the rig.
3. Be sure to obtain name, address and call of the seller.
4. Never purchase a rig that does not have a complete instruction manual.
5. Dicker about the price. If the price drops fairly easily, chances are good there is a hidden problem. (Note: if the unit is a popular currently manufactured brand you can reasonably assume any problem can be corrected if the unit is basically functional, i.e., receiver works and transmitter puts out power.)

The Flip Side

Quite often, older rigs in good shape can be purchased at very low prices. If a price is low enough I can do *something* with the unit, even if it is only salvaged for parts.

For example, I recently saw a fellow unload a Heath HW-100 (180 watts 80 through 10 meters SSB/CW transceiver) from the trunk of his car. Being a "Heathie" from way back, I casually asked the price. "Thirty five dollars," sez the owner! Trying to appear casual and only semi-interested as I tore the back pocket off my trousers getting my wallet out, I shouted "SOLD!"

The owner had a complete manual, as well as the power supply and a speaker with the unit. Since I own a HW-101, which is very similar and uses a lot of the same parts, I felt that even if the rig was a complete washout, the case and parts were well worth the 35 bucks if needed to repair my 101. Well, the rig did indeed have a problem:

the present owner simply did not know how to keep the tuning dial from slipping; as a result, it was impossible to know what frequency the rig was tuning. It took ten minutes of reading time in the manual and 30 minutes with a screwdriver (mostly removing the cover screws) to repair the problem. And, as long as the cover was off, an hour and a half was spent realigning the bargain rig. Now I have a beautiful and very functional HW-100 in my shack (photo).

To sum up: if you buy gear at a hamfest, and cannot have a demonstration, expect it to require repair. If you can get it at your price, go ahead and buy, but be sure the price is low enough to cover *any* expenses.

New All Band (160 thru 10) Meter Antenna

I recently erected an all band antenna that really works great! The antenna is center fed and has an SWR of under three to one on all bands, is less than 95 feet long and can be erected as a horizontal dipole, sloper, or inverted vee. In addition, it is possible to cut the length in half and still obtain excellent results on 160 through 10 meters (including the WARC bands). The antenna is the ANT FARM MB-1A.

Constructed of high quality 14 gauge copper wire, the antenna includes a weatherproof center insulator, matching section, a hook on the center insulator to hang the antenna as an inverted vee, and is fully constructed. All you need do is put it up and attach the 50 ohm feedline.

I put my antenna up as an inverted vee; the top was about 35 feet high and the ends drooped to about 8 feet above ground. Checking the SWR was a bit disconcerting, as it was 2.2:1 at the best point on 40 meters and between 1.5:1 and 3:1 on the other bands. The manufacturer states that this is normal, as the antenna was designed to operate easily with automatic antenna tuners and will provide a flat match on all bands below ten meters. And it does indeed tune very easily with an automatic transmatch.

No Transmatch Operation

For my initial tests, the antenna was connected directly to the rig without a transmatch. Using an HW-9 QRP rig at 4 watts, I had 122 contacts in Europe, Africa, North America and South America. Subsequent tests resulted in excellent contacts on 80 through 15 meters (conditions on 10 meters were not good during the testing period.)

All continents were worked in a single weekend on 20 meters SSB with 100 watts. With the same 100 watts I was able to easily work stations at distances of 1000 to 1500 miles on 160 meters CW; on 75 SSB, stations all over the USA,

Rob Leonard's

Ham DX Tips

August is a month where the only thing you want to do is stay cool, and one way to stay cool is to DX in air conditioning. It is also one of the better months to test your antennae for the upcoming fall season. Here are some DX tips to help you do both:

DX NETS The Islands on the Air net meets Saturdays 1300 UTC at 14260 kHz and Sundays on 21260 kHz at 1300 UTC. Of course, many IOTA DXpeditions and operations appear on these frequencies at any time of day that the frequencies have propagation. **EASTERN CAROLINE ISLANDS** Operating from Belau Island will be a group of Japanese DXers using the callsigns: KC6IG, KC6IH, KC6IJ, KC6IK, KC6IM, KC6I, KC6KY, KC6OG, KC6TZ and KC6UP (QSL all to JA3OIN, Tadashi Hashimoto, 40-7 Daigokuden, Kaidecho Mukoh 6 17, Japan). This group will operate 8 to 13 August on the following frequencies: 3795, 7060, 14195, 21295, 28495 kHz SSB; 3505, 7005, 14005, 21005, 28005 kHz CW; 14080, 21080, 28080 kHz RTTY and on six meters SSB and CW. **EQUATORIAL GUINEA** 3C1TR can be found meeting with his QSL manager (Joseph L. Pontek Sr., P.O. Box 80262, Indianapolis, IN 46280) K8JP daily on 14195 or near that frequency between 2120 and 2230 UTC. **FRENCH GUYANA** FR5FY is near 18145 kHz daily at 1930 UTC. QSL to Didier Bironneau, B.P. 166, F-973 Kourou, French Guiana. **IRAQ** YI1DZ (Diah, P.O. Box 7361, Baghdad, Iraq) has been on 14247 kHz in the WA4JTK DX net around 0100 UTC most days. Diah asks that when you request a QSL that you send IRC's only for return postage, nothing else. **ITALY** Eliseo Chiarucci, IK6BAK, (whose address is Loc Sterpetti 50, I-61030 Montefelcino, Italy) operates two 24 hour CW propagation beacons which might be very useful during these times of low sunspot activity. The beacon on 18068 kHz transmits Eliseo's callsign at 5 watts and the one on 24915 kHz uses 10 watts. Eliseo is interested in reception reports. **MACEDONIA** 4N5JA can be logged by SSB DXers between 1900 and 2000 UTC on the frequency of 14247 kHz. RTTY DXers can log this new DXCC country by catching 5N4JA on 14085 kHz starting at 0200 UTC. 4N5JA's address is: Venco Stojcevski, Ive Lole Ribara 92, 92000 Stip, Rep of Macedonia. **NIGERIA** Several Nigerian stations have been meeting on the frequency of 14210 kHz at 2100 UTC Wednesdays, Saturdays and Sundays. Two such stations are 5N1DMA and 5N6NEM, both of whom can be QSLed via their manager Bob Page, 3418 Golf Club Lane, Nashville, TN 37215. **SOUTH SUDAN** John Fung-Loy (Straussin 4, NL-2551 NM S Gravenhag, Netherlands) will be operating from here 'til 1 September as ST0/PA3CXC. John will be concentrating on CW on or near the following frequencies: 1832, 3510, 7002, 10101, 14020, 18070, 21020, 24895 and 28020 kHz. **TUNISIA** Romeo Stephanko, noted world traveler and DXer plans to operate from here starting around 8 August. Possibly using the callsign 3V0RR or 3V0AA. Look for Romeo and his international crew using the usual DX freqs: 14195, 21295 and 28495 kHz SSB; 14020, 21020, 28020 kHz CW; and 14085, 21085 and 28085 kHz RTTY. At the time of this writing, it is believed that QSL requests should be sent to Romeo's friend NT2X (Ed Kritsky, P.O. Box 300715, Brooklyn, NY 11230) who will pass them on to Romeo. **WAKE ISLAND** Members of the California Polytechnic State University Amateur Radio Club will be operating from here 31 August to 10 September. The group will be on satellite using the 2 meter SSB frequencies of 145.885 to 144.895 kHz, 6 meters SSB and CW, as well as the following HF frequencies: 3795, 7060, 14195, 18145, 21295, 24945, 28495 kHz SSB; 3505, 7005, 14005, 18070, 21005, 24895 and 28005 CW; 14083, 21083 and 28083 kHz RTTY. They advised that QSL requests should go to the Oklahoma DX Assn., P.O. Box 73, Wellston, OK 74881.

Well, that's it for another month; stay cool and good luck with the DX. 73 de Rob

Caribbean and Central America reported good signals from the MB-1A.

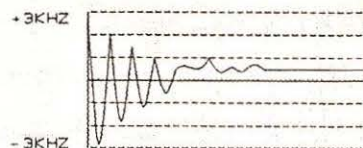
I did not use a transmatch for most of my testing, and performance did not suffer in the least; however, the manufacturer recommends use of a transmatch with all modern rigs (solid state finals). Without a transmatch, average SWR was under 3:1 on all bands except 10 meters; here it was over 3:1 on the low end of the band, but about 2.2:1 in the SSB portion. When a transmatch was connected to the rig, a 1:1 match was obtained on all bands 160 through 15 meters; on ten meters the best I could do was 1.7:1 on the low end (quite acceptable). A 1:1 match was easily obtained above 28.3 MHz.

This antenna has consistently performed at least as well as my Cushcraft R-7 on 40 through 15 meters. (The R-7 does not cover 80 or 160 meters.) For the size and price, the MB-1A is a tough antenna to beat.

The MB-1A is available from The Ant Farm, P.O. Box 3196, Wescosville, PA 18106-0196. The price is \$42.00 postpaid in the 48 states; Alaska and Hawaii add \$4.50; DX add 20 percent for shipping and handling.

That's all for now, gang. Leep the letters coming, but please address all mail c/o Monitoring Times, not my call book address—tnx. 73 de Ike, N3IK

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VOA Using 7415 kHz

The area surrounding 7415 kHz has been the most common frequency range used by North American shortwave pirate broadcasters for several years. This channel has a new occupant. Since the first week of June, the Botswana relay station of the *Voice of America* has been heard daily on 7415 kHz between 1900-2200 and 0430-0530 UTC.

Thanks to a tip from John Vodenik at VOA's Bethany relay, *MT's* Skip Arey and I have noted reasonably decent signals from Botswana, even though summer is not a prime season for African reception in North America. During the winter African DX season, this one should boom in every day.

As we discussed in the June *MT*, most of the frequencies between 7355 and 7510 kHz are now in use every evening by powerful international broadcasters. Don Davis of Dallas, TX, wrote in to confirm the resulting mess as he scans the band with his ICOM R-71A.

In the 1993 edition of the *World Radio and Television Handbook*, well known broadcast engineer George Jacobs accurately points out that the 1992 World Administrative Radio Conference expanded the upper limit of the 41 meter international broadcasting band. The longstanding 7100-7300 range will be supplemented by 7300-7350 kHz, effective in the year 2007.

You don't have to wait until 2007 to hear out of band broadcasting above 41 meters. Powerful big signals like **WRNO** on 7355 and **WWCR** on 7435 have been joined during the last couple of years by stations such as the *Voice of America* on 7405 and **WEWN** on 7425 kHz. The VOA's new 7415 kHz service is just the latest entry. India has been broadcasting out of band on 7412 kHz for decades.

These big boys don't pay any attention to official international frequency allocations, but it's of course true that pirates don't pay any attention to broadcasting regulations either. Nevertheless, pirates will have to take note of the new blockbuster signals. Relatively flea-powered pirates usually are no match for co-channel 250 kilowatt megabroadcasters, although **CSIC's** Pirate Rambo effectively jammed VOA-Botswana's sign-off on one mid-June evening.

As this month's loggings indicate, many pirates are still using the 7415 kHz range when the frequency is relatively clear. But, a handful of pirates are already moving up or down in search of a clear channel. You have to patiently search around to find the stations. Places like 7460 and 7400 kHz are starting to see activity. The 6200-6300 and 6800-6990 kHz ranges are now good spots for pirate bandscanning. When the VOA is off the air around 0200 UTC, some pirates sneak

down to 7405 kHz. All of this advice is subject to change at a moment's notice.

On the positive side, the new VOA 41 meter service is a good way for DXers to verify Botswana. John Vodenik promises QSL's for all accurate reception reports, and his track record is wonderful. You can mail your VOA Botswana report to John at the VOA Bethany Relay Station, PO Box 227, Mason, OH 45040.

Cuban Jamming Update

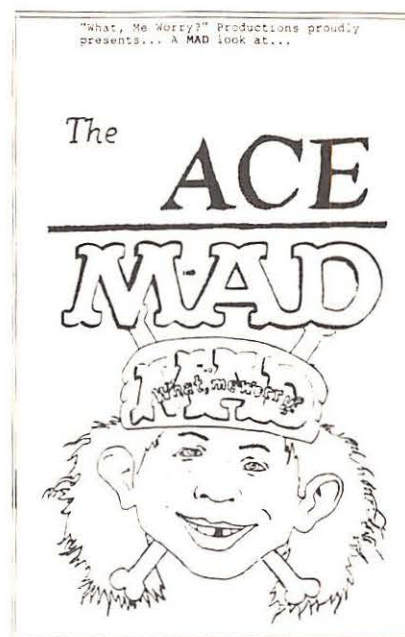
Last month we covered the unprecedented recent jamming of all anti-Castro shortwave clandestine stations. I personally first noticed the jamming in early May. However, *MT's* DXpert Glenn Hauser notes that the jamming actually has been continuous since February.

I'm still trying to pinpoint the modulation mode that is used by the Cuban jammers. When the targets of the jammers are occasionally off the air, sideband modes of my receivers detect no AM carrier in the jamming signals. They instead consist of a tone that is audible on both upper and lower sidebands of a suppressed carrier. When you tune away from their center frequencies, odd multiple tone combinations emerge that sound like constant automobile horns. Theories, anyone?

The jamming is present every evening on frequencies such as 9965, 9941.6, and 9495 kHz, but it is relatively ineffective at my Ohio location. Mark Seiden of Miami, FL, can't hear the jamming at all. This suggests that the jamming is probably ineffective inside Cuba, probably because the clandestines have very strong signals there that obliterate the interference. So, why do the jammers bother to try, and where exactly are the jamming transmitters located? Stay tuned.

Clandestine in English

Very few clandestine stations feature programming in English. This makes it difficult for new clandestine DXers to identify stations, since programming is produced in the language spoken by residents of a clandestine's target country. According to BBCMS, we have a new exception to this rule. The *Voice of the Great National Union Front of Cambodia* has introduced an English program on 5408 kHz every Thursday at 0100 and 1300 UTC. (Remember that the 0100 transmission would be on local Wednesdays in North America). BBCMS hears this English segment "in the middle of existing broadcasts in Cambodian" from the Khmer Rouge broadcaster. This is a tough DX catch, but it's worth a try.



WMAD's parody of the ACE Bulletin.

California Free Radio

Regular reporter Scott Edwards of Los Alamitos, CA, received an interesting promo newsletter from **KPFFK**. This licensed FM station in West Hollywood, CA (90.7 MHz) is part of the politically leftist Pacifica Network. KPFFK is raising funds to purchase equipment for **Radio Farabundo Marti**, the former left wing El Salvador clandestine that now is a licensed FM broadcaster. This newsletter also says that **Bush Radio**, a new South African station, has unsuccessfully applied for a broadcasting license from the South African government. It went on the air anyway, but was busted. The FAX number at Bush Radio is 011-27-21-448-5451.

A news release from **Free Radio Berkeley** reached *MT* in Brasstown. This "micro power" FM pirate uses 81.1 MHz in Berkeley, CA. It models itself after **Black Liberation Radio** in Illinois, which we have often discussed in this column. Free Radio Berkeley alleges that Pacifica Network station **KPFA** in the Bay Area has changed its format from "People's Radio" to "Master Card Radio," so the pirate airs community programming that KPFA won't accept.

Pirate QSL's

Every month we print addresses used by pirates that are logged by our readers. Gayle Van Horn prints some of the resulting QSL's in "The QSL Report" column. Following is additional evidence that many pirates are excellent verifiers.

Scott Krauss of Cleveland, OH, bagged full data veries from Pete the Pirate at **WRV**, Doug Barley at **WSKY**, and Howard E. Lyon at the

Voice of Oz. Craig McMaster of South Lima, NY, reports an identical **Voice of Oz** QSL from Lyon, as well as full data replies from Ralphus at **Radio Blandx**, Al Jaffe at **WMAD**, and Charles Poltz of **WLIS**. Jaffe enclosed a hilarious eight page parody of the **ACE** bulletin that we picture here. All of these replies arrived in three weeks to three months for reports (with three 29 cent stamps enclosed) mailed to addresses listed in recent 'Outer Limits' columns.

Sometimes you have to be a little more patient. Rob Ross of London, Ontario, reports a QSL for a report mailed years ago to the Clackamas, Oregon, address of the now inactive **Voice of Tomorrow**. Mike Rosetti has recently responded to a large and very old pile of letters.

The German DX bulletin *Radio von unten* says that a comprehensive list of 230 "actual" Europirate addresses is now available for 4 Deutsche Marks, \$3 US, or 4 IRC's. Orders go to Thorsten Brandenburg, Georg-Pickl Wes 7, D-8000 Munchen 50, Germany.

What We Are Hearing

Recently heard North American pirate stations listed this month use the following addresses for correspondence with listeners: PO Box 452, Wellsville, NY 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 146, Stoneham, MA 02180; PO Box 402, Glen Oaks, NY 11004; and 82 Pentland Place, Kirkcaldy, Scotland, UK. Listed frequencies are in kHz, with times in UTC:

CRSM- 7413 at 0215. **Radio Scottish Montreal** has adopted these new call letters. They showcase ethnic Scottish music and analysis of Scottish issues in Quebec, sometimes in joint broadcasts with **Pirate Rambo**. Addr: Blue Ridge Summit. (Alan Masyga, Winona, MN; Mike Leclerc, Somers, CT; McMaster)

CSIC- 7413 at 2245. **Pirate Rambo**, the host at the "Voice of the Great White North," is probably the most consistently active and most widely heard North American pirate. Addr: Blue Ridge Summit. (Greg Doerschler, Worcester, MA; McMaster; Leclerc)

Down East Radio- 7415 at 2300. Recent shows have featured storytelling with New England themes by announcer Uncle Harry. Addr: Blue Ridge Summit. (Pat Murphy, Chesapeake, VA)

Hit Parade Radio- 7413 at 0215. Here's a station that resurrects the old top 40 hit parade format of years gone by. Jon points out that verie signer Dale Dorman uses the name of a veteran Boston disc jockey. Addr: Wellsville. (Jonathan Melick, Dorchester, MA)

KMRZ- 7414 at 2315. Dr. Lobotomy has had some trouble with his 41 meter transmitter lately, so he often moves down to 6205 or 6240 kHz for his rock (or sometimes reggae) music shows. Addr: Wellsville. (Doerschler; Leclerc; Masyga; Murphy)

North American Pirate Relay Service- 7413 at 2315. Although this one sometimes produces its own programming, its main focus is relays of other pirates. Addr: Wellsville. (Doerschler)

Pirate Radio Boston- 7415 at 1330. A few stations, including this one, sometimes transmit programming immediately prior to the Sunday morning ANARC Shortwave Listeners Net on 7240 kHz. (The net is run by licensed amateurs, not pirates). Addr: Stoneham. (Murphy)

Radio Airplane- 6951 at 0215. Pirate Captain Eddy has found a frequency that is not subject to brutal interference from superpowered licensed broadcasters. Gigi logged it while entertaining a neighbor's grandson, who was thrilled to hear his first pirate! Addr: Wellsville. (Gigi Lytle, Lubbock, TX)

Radio Azteca- 7415 at 0100. Bram Stoker is obviously very active and knowledgeable in the DX hobby, so his DX program and mailbag show parodies are highly amusing. He's easy to ID through his interval signal, which is the trumpet fanfare from the Bullwinkle show. Addr: Wellsville. (Leclerc)

Radio Stella International- 7413 at 2315. Jock Wilson of this long running Europirate is still producing shows for relay in our hemisphere by NAPRS. Addr: Kirkcaldy. (Doerschler; Leclerc)

Radio USA- 7420 at 0015. Mr. Blue Sky and Joe King have been around for a decade, despite last year's FCC bust controversy. They still mix punk rock with funny comedy sketches. The result is very entertaining. This one definitely shifts frequencies to avoid interference from licensed broadcasters. Addr: Wellsville. (Masyga)

Voice of Laryngitis- 7406 at 0200. Many consider Laryngitis to be the most entertaining pirate of all time. Genghis and Stanley Huxley's new "Pirate Busters" material features J. Eager Heaver chasing the **Voice of the Night**

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around 41 meters, with assistance from Rev. Billy Bob Huxley. Friendly Freddie's Budget Burials (where death is cheap) is still the sponsor. Addr: Wellsville. (George Zeller, Cleveland, OH)

Vox America- 7417 at 2300. The male announcer at this new one sometimes plays rock music, but he straddles the line between pirate broadcasters and two-way bootleg QSO stations. He occasionally jams other pirates, perhaps inadvertently. Addr: None. (Murphy)

WEED- 7415 at 0730. Their male announcer hosts slick productions of rock music and pro-marijuana commentary from an announced location in California. This was Chris' first pirate; congrats! Addr: Unfortunately still none. (Christopher Scheiner, St. Louis, MO)

Wire Line Radio- 7437 at 2330. Many of their shows have been announced as tests that attempt to overcome modulation problems. They mix various musical styles, mailbags, and relays of other pirates. Addr: Blue Ridge Summit. (Leclerc)

WJLR- 7415 at 0400. A raspy voiced DJ at **John Lennon Radio** plays rock music, but his playlist is not restricted to Lennon's songs. They use a strange synthesized sound as an interval signal. Pat was mentioned during the show that he heard! Addr: None yet. (Murphy; Leclerc)

WKIK- 7415 at 0400. Miscellaneous activity still emanates from this strange operation. The station often relays Jacksonville, FL, licensed broadcasters or old RNI shows, but it also produces rock music fare. Tim's first pirate; welcome! (Tim Rahto, Baltimore, MD)

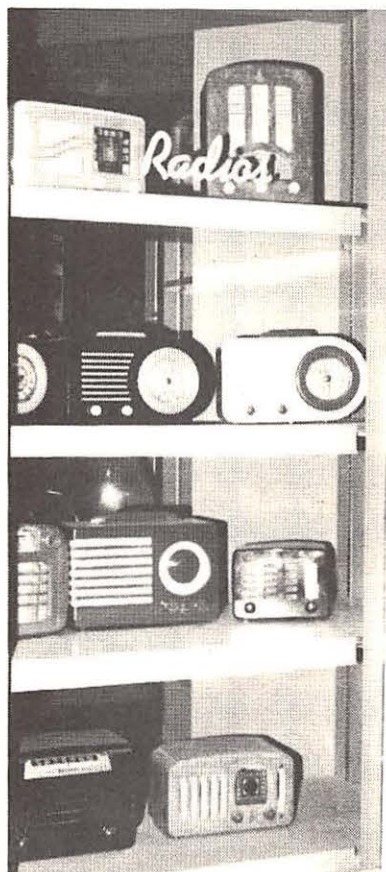
WRCR- 7415 at 2245. Also ID'ing as **Reality Check Radio**, they claim to be concerned citizens who want to deliver a message in support of free radio broadcasting. Addr: None; said they might verify logs in **ACE**. (Leclerc, Masyga)

WREC- 7415 at 1330. P. J. Sparx also calls his station **Radio Free East Coast**. He sometimes relays other pirates, and recently transmitted a joint rock and mailbag program with Charlie Loudnboomer of **Pirate Radio Boston**. Addr: Wellsville and Blue Ridge Summit. (Murphy)

WRMR- 1620 at 0130. Even during the summer, it is a good idea to occasionally scan this medium wave frequency for pirate activity. You might find this rock oldies station. Addr: Glen Oaks. (Doerschler)

WRV- 7415 at 0200. Pirate Pete has been widely heard with rock music from "The Radio Virus, the station that nobody wants to catch." Addr: Wellsville. (Leclerc; Murphy)

MT



The Information Age: *A Stroll Down Memory Lane at the Smithsonian*

By Benjamin Meyer

tive in the basement and the beam antenna on the roof. The museum houses all kinds of Americana from presidential artifacts and first ladies' dresses to "Big Daddy" Don Garlits' nitro-methane fueled "Swamp Rat" dragster.

The Information Age Exhibit alone is worth the trip. It traces communication technology from its early beginnings at the turn of the century up to the present. Landmark devices from the telephone and radio, leading up to television and computers are on display.

The early radio memorabilia includes TRF (Tuned Radio Frequency) receivers, with their three tuning knobs instead of one; speaker horns; and the huge ribbon microphones that were used in radio studios. The display also includes racks from tube computers such as the famous Sperry Univac ENIAC, as well as early mechanical "calculating engines."

The development of radar and code-breaking devices during WWII is well-chronicled. A Navy shipboard CIC (Combat Information Center) mockup is displayed. The Smithsonian didn't leave anything out; you can even touch a full scale atomic bomb!

The part that I enjoy the most demonstrates consumer electronics from the end of WWII up to the present day. These are the devices of my youth and I'm familiar with their innards.

This "golden age" of consumer electronics begins in the late 40's when TV receivers, Hi Fi, long-playing records, tape recorders, and FM radio were first introduced to the public. You can't imagine how old I felt when I spotted the Meissner FM tuner, just like the one that I had as a teen. It was just behind a Pilotuner and to the right of one of those plastic 45 record players that RCA sold at cost to plug into their TV sets. At the time, RCA was battling Columbia over the LP—but that's another story.

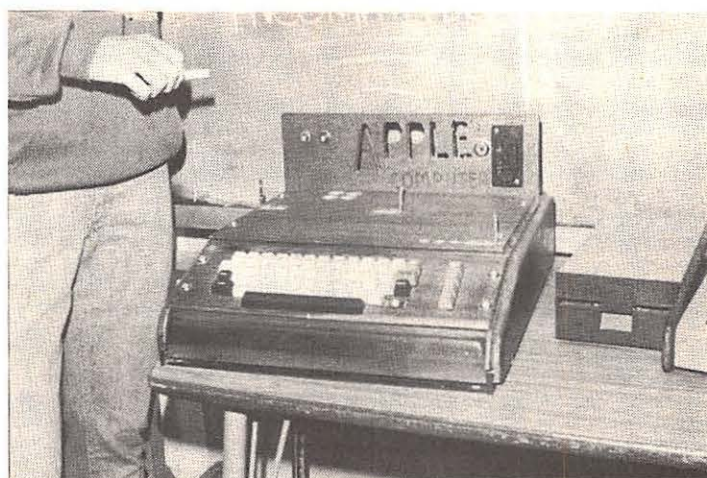
The Meissner FM Tuner I possessed had an intermittent problem that no one had been able to pin down, because as soon as you hit it a certain way or took it out of its wooden cabinet, it worked just fine. A family friend gave it to me along with a maroon Bogen 8-watt PA amplifier and GE 8-inch wide range speaker when he upgraded to Macintosh equipment. It may have been a primitive setup, but to me it was a quantum leap above the AM receivers I was used to. It sounded great and I was immediately hooked on Hi Fi sound.

The friend told me that he was confident that some day I would be able to fix it. He was right; I learned a lot probing around its chassis for hours on end. Eventually I found that the problem was caused by a defective IF transformer.

If you're in Washington, DC, this summer be sure to visit the National Museum of American History, part of the Smithsonian Museum Group. It's located at 14th Street and Constitution Avenue, near the Washington Monument (Metro Smithsonian Station). You'll recognize the building by the full-size railroad locomotive



Such mockups as this Navy station bring radio history alive.



The Apple computer prototype is preserved in its handmade wooden box.

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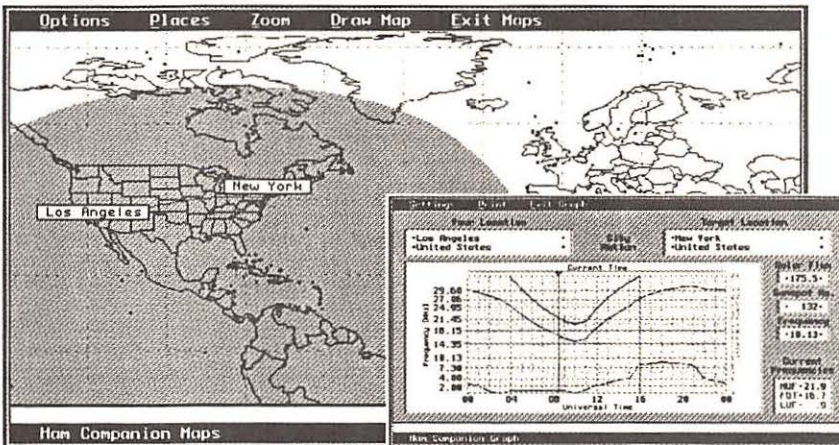
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512K RAM

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Foreign Ship \$10
Foreign Air \$25



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The exhibit also includes control consoles from early computers including the premier IBM 360. Because computer chips were not yet invented when the 360 was built, IBM made its own plug-in circuits using miniaturized components: transistors, resistors, and capacitors.

Transistor crystals were "grown" and then sliced like bologna. The individual slices were then diced into miniature transistors. Three gold contacts were fastened to each transistor for emitter, base, and collector connections. These components were mounted to ceramic wafers with the conductive circuit traces printed on them with platinum paste, and then the whole thing was encapsulated in RTV (Room Temperature Vulcanizing) Rubber. I documented this unique manufacturing process for IBM in 1965.

Two studio cameras made by RCA — one color and one monochrome — are on display. RCA, a dominant force in electronics only 20 years ago, is now history, although the tradename still lives on. I miss the old familiar red RCA "meatball" logo.

Early PC's are on display including a proto-type Apple in a crude homemade wooden case, as well as a Commodore C64 just like the one that I still have.



Imagine how old I felt when I spied the Meissner FM tuner I had as a teenager.

An active ham radio station that was dismantled from another exhibit has been set up in the Information Age exhibit, and is occasionally active. The beam antenna can be seen from the mall side of the building.

The Information Age Exhibit is part of our culture and should be viewed by all of us technocrats. What was a bit disturbing is that most of the great landmark inventions on display are no longer manufactured domestically. In fact, many of the manufacturers who introduced them to us, once household words, are no longer in existence. This gave me sort of an empty feeling



Early walkie-talkies were no light-weight handhelds!

like I was walking through the ruins of ancient Athens, Greece, or Egypt.

Near the exit was a Hitachi HDTV Receiver displaying an unbelievably detailed image from a Pioneer Laser Disk Player.

A shop located next to the exhibit sells neat stuff like posters, ties decorated with printed circuits, tie tacks made from computer keys, and audiotapes of popular radio programs.

When you visit our nation's capitol, don't miss this fine exhibit. Somewhere along this stroll down memory lane, you'll find a few stories of your own.

MT

Has the heat got you down? August has arrived, and for many of us the hobby takes a break! Why not spend your break updating your hobby correspondence? Now is a great time to get out those reception reports or compile your DX season "Hit List."

This month we have a few address updates for you. Radio Portugal has a new QSL address as; RDP International/Radio Portugal, English Service, Box 1011, Lisbon 1001 Portugal.

WWCR has a temporary address; P.O. Box 1963, Madison, TN 37116.

Radio Galaxy is QSLing reports from P.O. Box 7, Moscow, Russia 117418.

Our most sought after address is for the VOA Thailand relay station. U.S. listeners should send their report to; Thailand QSL, Room 1547, Voice of America, Washington, DC 20547. Outside the U.S., try Room G-759 at the same address.

BENIN

ORTB-Parakou, 5025 kHz. Partial data (date only) logo/map card with illegible signature and apology for delay. Received in 325 days for a French report, audio tape, two U.S. dollars and souvenir postcards. Station address: Radiodiffusion Du Benin, Boite Postal 366, Cotonou, Benin. (Charlie Washburn, Robbinston, ME)

BRAZIL

Radio Inconfidencia, 6010 kHz. Full data scenery cards, verified by Eugenio Silva. Personal letter and station sticker included. Received in 23 days for a Portuguese report and one U.S. dollar. Station address: Caixa Postal 1027, 30161-970 Belo Horizonte, Minas Gerais, Brazil. (Arsenio Fornaro, Brooklyn, NY)

Radio Nacional de Sao Gabriel da Cachoeira, 3375 kHz. Full data letter and card signed by Luis dos Santos Franca-Gerente. Received in 24 days for a Portuguese report and one U.S. dollar. Station address: Av. Pres. Costa e Silva s/n, 69750-000 Sao Gabriel da Cachoeira, Amazonas, Brazil. (Fornaro, NY)

CHILE

CBV-Playa Ancha Radio, 22768 kHz. Full data QSL card received via registered mail. QSL verified by, German Valdivia Ibarra-Capitan de Fragata Lt. Received

in 78 days for a Spanish utility report, souvenir postcard and sticker. Station address: Playa Ancha Radio-CBV, Subida Carvallo S/N, Playa Ancha, Valparaiso, Chile. (Carlos Felipe Da Silva, Sao Bernardo do Campo, Sao Paulo, Brazil)

CYPRUS

BBC Relay Station. Full data map/antenna card verified. Received in 7 weeks for an English report. Station address: P.O. Box 219, Limmasol, Cyprus. (Errol Ubelis, Kings Park, NY)

FRENCH POLYNESIA

Tahiti LDOC, 8867 kHz. Full data prepared card, verified by Claude Bourcier-Chef Subdivision Controle. Station portfolio and personal letter included. Received in 3 weeks for an English utility report and mint stamps. Station address: La Centre de Controle du trafic aerien de Tahiti faaa, Boite Postal 6011, FAAA Aeroport, Tahiti French Polynesia. (ED Rausch, Cedar Grove, NJ)

GERMANY

DAM-Norddeich Radio, 8638.5 kHz. Full data QSL card and sticker. Received in 20 days for an English utility report. Station address: Postfach 11 90, 2980 Norden 1, Germany. (Da Silva, Brazil)

INDONESIA

Kalimantan-RRI Samarinda, 9614.4 kHz. Full data personal Indonesian QSL/letter verified. Received in 1 month for an Indonesian report. Station address: Kotak Pos No. 45, Samarinda, Kalimantan Timur 75001, Indonesia. (Steve Price, Conemaugh, PA)

Sumatra-Voice of Indonesia, 9675 kHz. Full data multicolored card, without veri signer. Received in 2 months for an English report and mint Indo stamps. Station address: P.O. Box 157, Jakarta, Indonesia. (Rausch, NJ) (Washburn, ME) (Sam Wright, Biloxi, MS)

MAURITANIA

Radio Mauritanie, 4845 kHz. Full data color map/logo card verified. Received after six years of French follow-ups. Station address: Boite Postal 2000, Nouakchott, Mauritania Islamic Rep. (Price, PA)

NON-DIRECTIONAL BEACONS

SFM-San Francisco De Macoris, Dominican Rep. 300 kHz. Full data prepared QSL card verified. Received in 49 days for an English utility report and one U.S. dollar.

Station address: Departamento De Regulaciones Aeronauticas, Aeropuerto Internacional "Las Americas" Cabo Caucedo, Republica Dominicana. (Hank Holbrook, Dunkirk, MD)

DFI-Defiance, OH. 246 kHz. Full data prepared QSL card verified by Anthony R. Saxton-Manager. Received in 6 days for an English utility report and mint U.S. postage. Station address: Defiance Memorial Airport, Defiance, OH 45701. (Holbrook, MD)

TU-Tupelo, MS. 420 kHz. Full data prepared QSL card verified by Thomas E. Hardin-FAA Elec. Tech. Received in 31 days for an English utility report and mint U.S. postage. Station address: FAA-C.D. Lemons Airport, Tupelo, MS. (Holbrook, MD)

OMAN

BBC Relay Station, 15310 kHz. Full data map/logo QSL, verified by D.P. Bones-Senior Transmitter Engineer. Received in 3 months for an English report. Station address: British Eastern Relay Station, Masirah Island, Sultanate of Oman. (Urbelis, NY)

PAPUA NEW GUINEA

Radio New Ireland, 3905 kHz. Partial data letter verified by Ruben Bale. Received in 3 weeks for an English report and PNG mint stamps. Station address: P.O. Box 140, Kavieng, New Ireland-Papua New Guinea. (Ed Rausch, Cedar Grove, NJ)

PERU

Radio Satellite, Cajamarca, 6725 kHz. "Certificado de Sintonia" partial data and personal letter from Sabino Llamo Chavez-Gerente. Received in 82 days for a Spanish report, one U.S. dollar and souvenirs. Station address: c/o Radio Satellite, Jr. Cutervo no 543, Prov. Santa Cruz, Cajamarca, Peru. (Da Silva, Brazil)

SOLOMON ISLANDS

SIBC, 5020 kHz. Full data station card, without veri signer. Received in 3 months for an English report and Solomon Islands mint stamps. Station address: P.O. Box 654, Honiara, Solomon Islands. (Rausch, NJ) (Doug Merkel, St. Louis, MO)

ST. KITTS

Radio ZIZ-555 kHz AM. Full data station card signed by Terence Henry-Chief Engineer. Received in 1.5 months for an English AM report. Station address: P.O. Box 331, Springfield Basseterre, St. Kitts. (Rausch, NJ)

SHIP TRAFFIC

TARN-LAJM4, 500 kHz (RO/RO/General Cargo). Full data prepared QSL card verified. Received in 61 days for an English utility report and one U.S. dollar. Ship address: c/o Barber Int'l A/S, P.O. Box 2557 Solli, 0203 Oslo, Norway. (Holbrook, MD)

LAUST MAERSK-OXGS2, 156.65 MHz (Container). Full data prepared QSL card verified and fact sheet on vessel. Received in 73 days for an English utility report and one U.S. dollar. Ship address: A.P. Koller-Esplanaden 50, DK-1098 Copenhagen, Denmark. (Holbrook, MD)

UNITED STATES

USN MARS Station, Gulfport, MS-NNNONIM, 14441.5 kHz. Full data prepared QSL card verified. Received in 10 days for an English utility report and an SASE. Station address: 20th NCR, R-50 Code, Gulfport, MS 39501. (Timothy Starr, Swansea, SC)

This RFO votre Radio, Tahiti, QSL is "full of beautiful color" according to its recipient Mrs. Leslie Edwards of Doylestown, PA.



Tahiti



POLYNÉSIE FRANÇAISE BP 125 PAPEETE

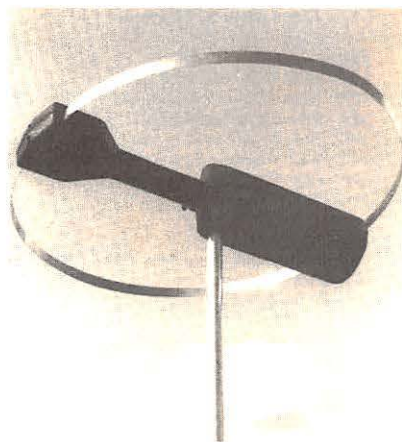
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11825 KHZ	20 Kw
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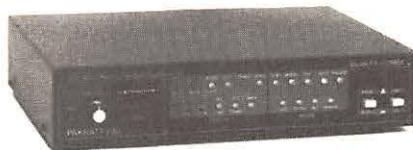
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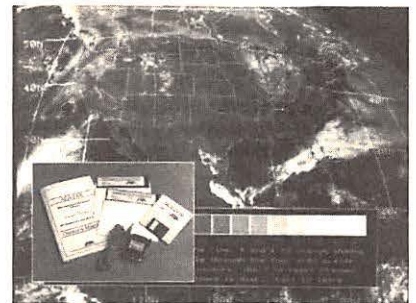
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How to Use the Shortwave Guide

1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Daylight Saving Time) 4, 5, 6, or 7 hours for Eastern, Central, Mountain, or Pacific Time, respectively.

Note that all dates, as well as times, are in UTC: for example, the BBC's "Ken Bruce Show" (0030 UTC Sunday) will be heard on Saturday evening (8:30 PM Eastern, 5:30 PM Pacific) in North America, not on Sunday.

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours. If it's news you're interested in, check out the complete "Newslines" listing, which begins on the next page.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a re-run, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday T: Tuesday H: Thursday S: Saturday
M: Monday W: Wednesday F: Friday

3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be found at the top half of the page. All frequencies are in kHz..

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

4: Choose the most promising frequencies for the time, location, and conditions.

Not all stations can be heard and none all the time on all frequencies. To help you find the most promising frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

am: The Americas	as: Asia
na: North America	au: Australia
ca: Central America	pa: Pacific
sa: South America	va: various
eu: Europe	do: domestic broadcast
af: Africa	om: omnidirectional
me: Middle East	

Consult the propagation charts. To further help you find the right frequency, we've included propagation charts at the back of this section, which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

Programs for Shortwave Listeners: This section, published quarterly, lists programs with news and information about shortwave radio for listeners. (RR) denotes reruns of programs broadcast earlier in the week. For brevity, only programs at certain peak listening times are included.

Sundays			0300 WHRI: World Of Radio	0215 RAE, Buenos Aires: DX Actuality
0013	Spanish National Radio: DX Spot	0430	Radio New Zealand Int'l: Mailbox (biweekly)	0250 Radio Budapest: DX World (RR)
0018	Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round	0637	Radio Vlaanderen Int'l: Radio World	0300 HCJB: Ham Radio Today (RR)
0039	HCJB: DX Party Line	1230	WWCR: World of Radio	0314 Radio Prague: DX Special (RR)
0106	Radio Prague: DX Special	1307	Radio Vlaanderen Int'l: Radio World (RR)	0530 HCJB: Ham Radio Today (RR)
0110	Voice of America (am,ca): Communications World	1325	Kol Israel: DX Corner	1150 Radio Netherlands: Media Network (RR)
0113	Spanish National Radio: DX Spot (RR)	1230	Polish Radio, Warsaw: DX Program (RR)	1350 Radio Netherlands: Media Network (RR)
0117	Deutsche Welle: Technical Tips For DXers (monthly)	1400	Voice of the Mediterranean: DX Program	1415 FEBC Radio Int'l, Philippines: DX Dial (RR)
0130	WHRI: World of Radio	1435	All India Radio: DX Corner (biweekly)	1550 Radio Netherlands: Media Network (RR)
0140	Radio Havana Cuba: DX'ers Unlimited	1500	Radio For Peace Int'l: World Of Radio (RR)	
0200	Radio For Peace Int'l: World Of Radio	1515	Radio Romania Int'l: Special Program For Radio Amateurs	Fridays
0215	KSDA, Guam: DX Asiawaves	2320	Radio Vilnius: Feature For DX'ers	0050 Radio Netherlands: Media Network (RR)
0218	Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round (RR)	2340	All India Radio: DX'ers Corner (biweekly) (RR)	0250 Radio Netherlands: Media Network (RR)
0230	Radio Romania Int'l: DX Mailbag			0350 Radio Netherlands: Media Network (RR)
0239	HCJB: DX Party Line (RR)	Tuesdays		1140 Radio Bulgaria: Radio Bulgaria Calling
0250	Radio Budapest: DX World	0245	Radio Romania Int'l: Special Program For Radio Amateurs (RR)	1152 Radio Yugoslavia: Radio Hams' Corner
0317	Deutsche Welle: Feature (RR)	0340	Radio Bulgaria: Calling Amateurs And DX'ers	1441 Radio Portugal: DX Program (monthly)
0330	Voice of Turkey: DX Corner (biweekly)	0600	Voice of the Mediterranean: DX Program (RR)	2115 WWCR: World of Radio
0335	WWCR: Spectrum	1130	Radio Australia: Communicator	
0340	Radio Havana Cuba: DX'ers Unlimited (RR)	1130	WWCR: World Of Radio (RR)	Saturdays
0305	WWCR: World Of Radio	1243	Radio Sweden: MediaScan (biweekly)	0040 Radio Bulgaria: Radio Bulgaria Calling (RR)
0406	Radio Prague: DX Special (RR)	1530	Radio Australia: Communicator (RR)	0052 Radio Yugoslavia: Radio Hams' Corner (RR)
0418	Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round (RR)	1610	Polish Radio, Warsaw: DX Program (RR)	0115 FEBC Radio Int'l, Philippines: DX Report (RR)
0509	HCJB: DX Party Line (RR)	1513	Radio Sweden: MediaScan (biweekly) (RR)	0141 Radio Portugal: DX Program (monthly) (RR)
0513	Spanish National Radio: DX Spot (RR)			0152 Radio Yugoslavia: Radio Hams' Corner (RR)
0517	Deutsche Welle: Feature (RR)	Wednesdays		0245 Radio Budapest: DX News (RR)
0530	Radio Japan: Media Roundup	0040	Radio Havana Cuba: DX'ers Unlimited (RR)	0340 Radio Bulgaria: Radio Bulgaria Calling (RR)
0540	Radio Havana Cuba: DX'ers Unlimited (RR)	0113	Radio Sweden: MediaScan (biweekly) (RR)	0400 Radio For Peace Int'l: World Of Radio (RR)
1035	Radio Korea: Shortwave Feedback	0213	Radio Sweden: MediaScan (biweekly) (RR)	0600 WHRI: World of Radio
1235	Radio Korea: Shortwave Feedback (RR)	0240	Radio Havana Cuba: DX'ers Unlimited (RR)	0618 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round (RR)
1430	Radio Japan: Media Roundup (RR)	0245	Radio Budapest: DX News	0637 Radio Vlaanderen Int'l: Radio World (RR)
1435	Radio Korea: Shortwave Feedback (RR)	0300	Radio For Peace Int'l: World Of Radio (RR)	1118 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round (RR)
1440	FEBC Radio Int'l, Philippines: DX Report	0415	BBC: Waveguide	1200 Radio For Peace Int'l: World Of Radio (RR)
1615	KSDA, Guam: DX Asiawaves (RR)	0440	Radio Havana Cuba: DX'ers Unlimited (RR)	1210 Voice of America: Communications World (RR)
1530	Polish Radio, Warsaw: DX Program	0640	Radio Havana Cuba: DX'ers Unlimited (RR)	1307 Radio Vlaanderen Int'l: Radio World (RR)
2300	Radio For Peace Int'l: World Of Radio (RR)	1100	Radio For Peace Int'l: World Of Radio (RR)	1318 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round (RR)
2300	WWCR: World Of Radio (RR)	1315	FEBC Radio Int'l, Philippines: DX Spot	1340 Radio Tashkent: DX Program (monthly) (RR)
				1500 Radio Romania Int'l: DX Mailbag (RR)
Mondays		Thursdays		1518 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round (RR)
0110	Radio Tashkent: DX Program (monthly)	0014	Radio Prague: DX Special (RR)	1610 Voice of America (eu): Communications World (RR)
0130	Radio Japan: Media Roundup (RR)	0100	HCJB: Ham Radio Today	1615 KSDA, Guam: DX Asiawaves (RR)
0135	Radio Korea: Shortwave Feedback (RR)	0130	BBC: Waveguide (RR)	2315 KSDA, Guam: DX Asiawaves (RR)
0145	FEBC Radio Int'l, Philippines: DX Dial	0150	Radio Netherlands: Media Network	2337 Radio Vlaanderen Int'l: Radio World (RR)
				2350 Radio Nacional, Bogota: Colombia DX

MT Monitoring Team

Gayle Van Horn, Frequency Manager
North Carolina

September Deadline: July 29

Kannon Shanmugam, Program Manager
Kansas

Dave Datko
California

B.W. Battin
New Mexico

Jacques d'Avignon
Propagation Forecasts
Ontario, Canada

John Carson
Oklahoma

Jim Frimmel
Texas

newsline

"Newsline" is your guide to news broadcasts on the air. • All broadcasts are world news reports unless followed by an asterisk, which means the broadcast is primarily national news. • All broadcasts are daily unless otherwise noted by the day codes.

0000 UTC (8:00 PM EDT, 5:00 PM PDT) BBC ("Newsdesk") CBC, Northern Quebec China Radio Int'l Christian Science Monitor Croatian Radio, Zagreb [M-A] Radio Australia Radio Bulgaria Radio Havana Cuba [T-S] Radio Moscow Radio New Zealand Int'l Radio Norway Int'l [M] Radio Prague Radio Thailand Radio Ukraine Int'l SBC Radio 1, Singapore Spanish National Radio Swiss Radio Int'l Voice of America WWCR [T-A] 0005 Radio Pyongyang 0010 China Radio Int'l* 0030 All India Radio Christian Science Monitor (as) [M] Christian Science Monitor [T-F] FEBC Radio Int'l, Philippines HCJB Radio Havana Cuba [T-S] Radio Moscow Radio Netherlands Radio New Zealand Int'l [M-F] Radio Yugoslavia Voice of America (am,as) (Special English) [T-S] Voice of America (as) (Special English) [M] 0035 All India Radio (News Service) 0055 WRNO [W, A] 0100 UTC (9:00 PM EDT, 6:00 PM PDT) BBC CBC, Northern Quebec [S-M] Christian Science Monitor Croatian Radio, Zagreb [S] Deutsche Welle FEBC Radio Int'l, Philippines Radio Australia Radio Canada Int'l Radio Havana Cuba [T-S] Radio Japan Radio Korea Radio Moscow Radio New Zealand Int'l [M-A] Radio Norway Int'l [M] Radio Prague	Radio Slovakia Int'l Radio Tashkent Radio Thailand Radiotelevisione Italiana SBC Radio 1, Singapore Spanish National Radio Voice of America Voice of Indonesia WWCR [T-A] 0115 Radio Havana Cuba* [T-S] 0130 Christian Science Monitor (as) [M] Christian Science Monitor [T-F] FEBC Radio Int'l, Philippines Radio Austria Int'l Radio Bangladesh Radio Havana Cuba [T-S] Radio Moscow Radio Netherlands Radio Portugal [T-A] Radio Tirana Radio Yugoslavia Voice of Greece 0145 Radio Finland [M-A] 0155 Radio Korea [T-A] Voice of Indonesia 0200 UTC (10:00 PM EDT, 7:00 PM PDT) BBC ("Newsdesk") CBC, Northern Quebec [T-S] Channel Africa, Johannesburg Christian Science Monitor Deutsche Welle Radio Australia Radio Budapest Radio Canada Int'l Radio Havana Cuba [T-S] Radio Moscow Radio New Zealand Int'l [M-F] Radio Norway Int'l [M] Radio Romania Int'l Radio Thailand RAE, Buenos Aires [T-A] SBC Radio 1, Singapore Swiss Radio Int'l Voice of America Voice of Free China Voice of Myanmar WWCR [T-A] 0215 Radio Cairo Radio Nepal Voice of Kenya 0230 Christian Science Monitor (af,me) [M] Christian Science Monitor [T-F] HCJB	Radio Havana Cuba [T-S] Radio Moscow Radio Netherlands Radio Pakistan (Special English) Radio Tirana SLBC, Sri Lanka 0245 All India Radio (News Service) 0250 Radio Yerevan 0300 UTC (11:00 PM EDT, 8:00 PM PDT) BBC CBC, Northern Quebec Channel Africa, Johannesburg China Radio Int'l Christian Science Monitor Deutsche Welle Radio Australia Radio Bahrain Radio Bulgaria Radio Havana Cuba [T-S] Radio Japan Radio Moscow Radio Prague SBC Radio 1, Singapore Voice of America Voice of Free China Voice of Kenya WRNO [F] WWCR [T-A] 0305 Radio Bangladesh 0309 BBC* 0310 China Radio Int'l* 0315 Radio Cairo Radio Havana Cuba* [T-S] 0330 BBC (af)* Christian Science Monitor (af,me) [M] Christian Science Monitor [T-F] Radio Austria Int'l [T-A] Radio Bahrain Radio Havana Cuba [T-S] Radio Moscow Radio Netherlands UAE Radio, Dubai Voice of Greece 0355 Radio Japan [M-F] WYFR (Network) [T-A] 0400 UTC (12:00 AM EDT, 9:00 PM PDT) BBC CBC, Northern Quebec [T-S] Channel Africa, Johannesburg China Radio Int'l	Christian Science Monitor Deutsche Welle Kol Israel Radio Australia Radio Bahrain Radio Canada Int'l Radio Havana Cuba [T-S] Radio Moscow Radio Norway Int'l [M] Radio Prague Radio Romania Int'l Radio Tanzania Radio Thailand SBC Radio 1, Singapore Swiss Radio Int'l Voice of America Voice of Kenya Voice of Turkey ZNBC Radio 2, Lusaka 0402 Radio Botswana 0405 Radio Pyongyang 0410 China Radio Int'l* 0425 Radiotelevisione Italiana 0430 Christian Science Monitor (af,as) [M] Christian Science Monitor [T-F] Radio Bahrain Radio Finland [M-A] Radio Havana Cuba [T-S] Radio Moscow 0445 BBC (af)* [T-F] 0450 Channel Africa, Johannesburg 0500 UTC (1:00 AM EDT, 10:00 PM PDT) BBC ("Newshour") CBC, Northern Quebec Channel Africa, Johannesburg China Radio Int'l Christian Science Monitor Deutsche Welle HCJB NBC, Windhoek Radio Australia Radio Bahrain Radio Canada Int'l [M-F] Radio Havana Cuba [T-S] Radio Japan Radio Lesotho Radio Moscow Radio New Zealand Int'l* [M-F] Radio Thailand SBC Radio 1, Singapore Spanish National Radio Voice of America Voice of Kenya	WWCR [M] ZNBC Radio, Lusaka 0510 China Radio Int'l* Radio Botswana [M-A] 0515 Radio Havana Cuba* [T-S] 0520 Radio For Peace Int'l [T-A] 0530 Christian Science Monitor (af,as) [M] Christian Science Monitor [T-F] Radio Austria Int'l Radio Havana Cuba [T-S] Radio Moscow Radio Romania Int'l Radio Thailand RTM, Malaysia UAE Radio, Dubai Voice of Nigeria 0545 Voice of Nigeria* 0600 UTC (2:00 AM EDT, 11:00 PM PDT) BBC BBC (af)* [A-S] Channel Africa, Johannesburg Christian Science Monitor Deutsche Welle GBC Radio, Accra* Radio Australia Radio Bahrain Radio Havana Cuba [T-S] Radio Korea Radio Moscow Radio New Zealand Int'l Radio Nigeria Radio Prague SBC Radio 1, Singapore Swiss Radio Int'l Voice of America Voice of Kenya Voice of Malaysia ZNBC Radio, Lusaka [M-A] 0603 Croatian Radio, Zagreb [M-A] 0605 Radio Pyongyang 0609 BBC* 0627 BBC (af)* [M-F] 0630 Christian Science Monitor [M-F] Radio Austria Int'l [T-A] Radio Havana Cuba [T-S] Radio Moscow Radio Romania Int'l Radio Vlaanderen Int'l RTV Congolaise, Brazzaville [M-F]
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Voice of Nigeria

0645

Radio Finland [M-A]

Radio Romania Int'l

Voice of Nigeria*

0650

Radio New Zealand Int'l* [M-F]

0655

Radio Korea [M-F]

0700 UTC

(3:00 AM EDT, 12:00 AM PDT)

BBC ("Newsdesk")

Christian Science Monitor

GBC Radio, Accra

LBS, Monrovia

MBC, Blantyre [M-A]

Radio Australia

Radio Bangladesh

Radio Japan

Radio Korea

Radio Liberia

Radio Moscow

Radio New Zealand Int'l* [M-F]

Radio Nigeria, Ibadan

SBC Radio 1, Singapore

SLBS, Freetown

Voice of Free China

Voice of Kenya

Voice of Myanmar

0703

Croatian Radio, Zagreb [S]

0705

Radio Pyongyang

0730

All India Radio (News Service)

BBC (af)* [A]

Christian Science Monitor [M-F]

HCJB

Radio Austria Int'l

Radio Ghana

Radio Moscow

Radio Netherlands

Radio Prague

0750

Radio For Peace Int'l [T-A]

Radio Pacific Ocean [A]

0755

Radio Japan [M-F]

Radio Korea [M-F]

0800 UTC

(4:00 AM EDT, 1:00 AM PDT)

BBC

Christian Science Monitor

GBC Radio 1, Accra [S]

GBC Radio 2, Accra

MBC, Blantyre [S]

Radio Australia

Radio Bahrain

Radio Finland [M-A]

Radio Korea

Radio Moscow

Radio New Zealand Int'l [S-F]

Radio Pakistan

SBC Radio 1, Singapore

SLBS, Freetown

Voice of Indonesia

Voice of Kenya

Voice of Malaysia

ZNBC Radio 2, Lusaka [M-A]

0802

Radio Botswana

0803

Croatian Radio, Zagreb [M-A]

0805

Radio Pyongyang

0830

All India Radio (News Service)

Christian Science Monitor [M-F]

Radio Austria Int'l

Radio Moscow

Radio Netherlands

Radio Slovakia Int'l

0840

Voice of Greece [M-A]

0850

All India Radio (News Service)

(Special English)

0855

Radio Korea [M-F]

Voice of Indonesia

0900 UTC

(5:00 AM EDT, 2:00 AM PDT)

BBC

China Radio Int'l

Christian Science Monitor

Deutsche Welle

GBC Radio 1, Accra [M-F]

GBC Radio 2, Accra

LBS, Monrovia

MBC, Blantyre [M-A]

Radio Australia

Radio Bahrain

Radio Japan

Radio Liberia

Radio Moscow

Radio Vlaanderen Int'l [M-A]

SBC Radio 1, Singapore

Swiss Radio Int'l

Voice of Kenya

Voice of Nigeria

0910

China Radio Int'l*

0930

All India Radio (News Service)

Christian Science Monitor [M-F]

FEBC Radio Int'l, Philippines

Radio Afghanistan

Radio Moscow

Radio Netherlands

0940

Radio Togo

0945

Deutsche Welle (af)* [M-F]

0955

Radio Japan [M-F]

1000 UTC

(6:00 AM EDT, 3:00 AM PDT)

All India Radio

BBC

Channel Africa, Johannesburg

China Radio Int'l

Christian Science Monitor

GBC Radio 2, Accra [A]

HCJB

IRRS, Milan [S]

Kol Israel

MBC, Blantyre [S]

Radio Australia

Radio Bahrain

Radio Moscow

Radio New Zealand Int'l [S-F]

Radio Tanzania

SBC Radio 1, Singapore

Voice of America

Voice of Kenya

WWCR [M-F]

WYFR (Network) [M-F]

ZNBC Radio 2, Lusaka [M-A]

1005

Radio New Zealand Int'l* [M-F]

1010

China Radio Int'l*

1030

Christian Science Monitor [M-F]

MBC, Blantyre [M-F]

Radio Austria Int'l [M-F]

Radio Bulgaria

Radio Korea

Radio Moscow

Radio New Zealand Int'l* [M-F]

Radio Prague

RTM, Malaysia

UAE Radio, Dubai

Voice of Nigeria

WYFR (Network) [M-F]

1040

Voice of Greece [M-A]

1055

All India Radio

1100 UTC

(7:00 AM EDT, 4:00 AM PDT)

BBC ("Newsdesk")

CBC, Northern Quebec [A-S]

Channel Africa, Johannesburg

Christian Science Monitor

Deutsche Welle

GBC Radio, Accra [A-S]

MBC, Blantyre [A-S]

Radio Australia

Radio Bahrain

Radio Japan

Radio Jordan

Radio Moscow

Radio New Zealand Int'l

("Newsdesk")

Radio Nigeria, Ibadan

Radio Pakistan

SBC Radio 1, Singapore

Swiss Radio Int'l

TWR, Bonaire [M-F]

Voice of America

Voice of Kenya

WWCR [M-F]

ZNBC Radio, Lusaka

1105

Radio Pakistan (Special English)

Radio Pyongyang

1110

Radio Botswana [M-F]

1115

Radio Nepal

1125

Radio Botswana [A-S]

WYFR (Network) [M-F]

1130

Christian Science Monitor [M-F]

Radio Austria Int'l [M-F]

Radio Finland [M-F]

Radio Lesotho

Radio Moscow

Radio Netherlands

Radio Thailand

Radio Vlaanderen Int'l [S]

Radio Yugoslavia

RTM, Malaysia*

1135

All India Radio (News Service)

1145

Deutsche Welle* [M-F]

1150

Channel Africa, Johannesburg

1155

Radio Japan [M-F]

1200 UTC

(8:00 AM EDT, 5:00 AM PDT)

BBC

CBC, Northern Quebec [A-S]

China Radio Int'l

Christian Science Monitor

LBS, Monrovia

MBC, Blantyre [M-F]

Polish Radio, Warsaw

Radio Australia

Radio Bahrain

Radio Canada Int'l (am) [M-F]

Radio Korea

Radio Moscow

Radio Nacional do Brasil [M-A]

Radio New Zealand Int'l [H-T]

Radio Nigeria, Ibadan

Radio Norway Int'l [S]

Radio Tashkent

Radio Thailand

RTM, Malaysia

SBC Radio 1, Singapore

SLBC, Sri Lanka

TWR, Bonaire [A-S]

Voice of America

Voice of Kenya

WYFR (Network) [M-F]

1203

Croatian Radio, Zagreb

1210

China Radio Int'l*

1215

HCJB [M-F]

1230

All India Radio (News Service)

Christian Science Monitor [M-F]

Radio Cairo

Radio Canada Int'l (as)

Radio Finland [M-F]

Radio France Int'l

Radio Moscow

Radio Netherlands

SLBC, Sri Lanka

WYFR (Network) [M-F]

1235

Voice of Greece

1245

SLBC, Sri Lanka

1255

Radio Bangladesh

Radio Korea [M-F]

1257

HCJB [M-F]

1258

Africa Number One, Libreville

1300 UTC

(9:00 AM EDT, 6:00 AM PDT)

BBC ("Newshour")

CBC, Northern Quebec

China Radio Int'l

Christian Science Monitor

GBC Radio, Accra

Kol Israel [S-H]

Radio Australia

Radio Bahrain

Radio Canada Int'l (am) [S]

Radio Iraq Int'l

Radio Jordan

Radio Korea

Radio Moscow

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SLBC, Sri Lanka
 Swiss Radio Int'l
 Voice of America
 Voice of Ethiopia
 Voice of Kenya
 WYFR (Network) [A]
1505
 Radio Pyongyang
1510
 China Radio Int'l*
1520
 Radio Estonia [M-F]
 Voice of Greece
1525
 BBC (af)* [S]
 Radio Veritas Asia [T-F]
1530
 All India Radio (News Service)
 Christian Science Monitor [M-F]
 Deutsche Welle* [M-F]
 FEBA, Seychelles
 FEBC Radio Int'l, Philippines
 Radio Austria Int'l
 Radio Bangladesh
 Radio Finland
 Radio Moscow
 Radio Netherlands
 Voice of Ethiopia
 Voice of Nigeria
1540
 Radio Veritas Asia [A-M]
 Voice of Nigeria*
1550
 Radio For Peace Int'l [T-A]
1555
 Radio Veritas Asia [A-M]

1600 UTC **(12:00 PM EDT, 9:00 AM PDT)**

BBC
 CBC, Northern Quebec [A]
 Channel Africa, Johannesburg
 China Radio Int'l
 Christian Science Monitor
 Deutsche Welle
 GBC Radio 2, Accra
 LBS, Monrovia
 MBC, Blantyre
 Radio Australia
 Radio Bahrain
 Radio France Int'l
 Radio Jordan
 Radio Korea
 Radio Lesotho
 Radio Liberia
 Radio Moscow
 Radio Nigeria
 Radio Norway Int'l [S]
 Radio Pakistan
 Radio Tanzania
 SBC Radio 1, Singapore
 Voice of America
 Voice of Kenya
 Yemen Radio
 ZNBC Radio 2, Lusaka [M-A]
1609
 BBC*
1610
 China Radio Int'l*
 Radio Botswana [M-F]
1615
 Radio Pakistan (Special English)
1630
 Christian Science Monitor [M-F]
 HCJB [M-F]
 Radio Canada Int'l (as)
 Radio Moscow
 UAE Radio, Dubai
 Voice of America (eu) (Special English)
1655
 Radio Korea [M-F]

1700 UTC **(1:00 PM EDT, 10:00 AM PDT)**

BBC
 CBC, Northern Quebec [A]
 Channel Africa, Johannesburg
 China Radio Int'l
 Christian Science Monitor
 GBC Radio 2, Accra
 IRRS, Milan [S]
 Kol Israel
 Polish Radio, Warsaw
 Radio Australia
 Radio Bahrain
 Radio Japan
 Radio Moscow
 Radio New Zealand Int'l* [M-F]
 Radio Nigeria, Kaduna
 Radio Norway Int'l [S]
 Radio Pakistan
 Radio Prague
 SLBC, Sri Lanka
 Swiss Radio Int'l
 Voice of America
 Voice of Kenya
 WWCR [M-F]
1705
 Radio Bangladesh
 Radio Pyongyang
1710
 China Radio Int'l*
1725
 Radio New Zealand Int'l* [M-F]
 Radio Surinam Int'l [M-F]
1730
 All India Radio (News Service)
 Christian Science Monitor [M-F]
 Radio Bulgaria
 Radio Moscow
 Radio Netherlands
 Radio Romania Int'l
1740
 BBC (af)*
1750
 Channel Africa, Johannesburg

1800 UTC **(2:00 PM EDT, 11:00 AM PDT)**

All India Radio
 BBC ("Newsdesk")
 CBC, Northern Quebec [M-H]
 Christian Science Monitor
 GBC Radio, Accra
 KVOH
 MBC, Blantyre
 Radio Afghanistan
 Radio Australia
 Radio Bahrain
 Radio Moscow
 Radio Nacional do Brasil [M-A]
 Radio New Zealand Int'l* [M-F]
 Radio Omdurman, Sudan
 Radio Portugal [M-F]
 Radio Tanzania
 Radio Vlaanderen Int'l
 Voice of America
 Voice of Kenya
 WWCR [M-F]
 ZNBC Radio, Lusaka
1805
 Radio New Zealand Int'l* [M-F]
1815
 ZNBC Radio 2, Lusaka*
1830
 BSKSA, Riyadh
 Christian Science Monitor [M-F]
 Radio Austria Int'l
 Radio Finland [S-F]
 Radio Kuwait
 Radio Mogadishu
 Radio Moscow
 Radio Netherlands

Radio Slovakia Int'l
 Radio Yugoslavia
 Voice of America (Special English)
1835
 Radio New Zealand Int'l* [F]
1840
 Voice of Greece
1845
 BSKSA, Riyadh*
 Radio Cote d'Ivoire
 Radio Guinea, Conakry
1855
 Radio New Zealand Int'l* [M-H]
 Radio Omdurman, Sudan
1857
 BBC (af)* [M-F]

1900 UTC **(3:00 PM EDT, 12:00 PM PDT)**

All India Radio
 BBC
 China Radio Int'l
 Christian Science Monitor [M-A]
 Deutsche Welle
 GBC Radio 2, Accra*
 HCJB
 Kol Israel
 KVOH
 Radio Australia
 Radio Japan
 Radio Liberia
 Radio Moscow
 Radio New Zealand Int'l [S-F]
 Radio Norway Int'l [S]
 Radio Portugal [M-F]
 Radio Romania Int'l
 Radio Vilnius
 RAE, Buenos Aires [M-F]
 SLBS, Freetown
 Spanish National Radio
 Voice of America
 Voice of Kenya
1903
 Croatian Radio, Zagreb [S]
 Voice of Greece
1910
 China Radio Int'l*
 Radio Botswana
1930
 BBC (af)* [S]
 Christian Science Monitor [M-F]
 Deutsche Welle* [M-F]
 Polish Radio, Warsaw
 Radio Ghana
 Radio Moscow
 Radio Netherlands
 Voice of Nigeria
1935
 Radiotelevisione Italiana
1945
 Radio Togo

2000 UTC **(4:00 PM EDT, 1:00 PM PDT)**

BBC
 CBC, Northern Quebec [S-F]
 China Radio Int'l
 Christian Science Monitor
 GBC Radio, Accra
 KVOH
 MBC, Blantyre
 Radio Australia
 Radio Bahrain
 Radio Bulgaria
 Radio Moscow
 Radio New Zealand Int'l [S-F]
 Radio Prague
 SLBS, Freetown
 Swiss Radio Int'l
 Voice of America

Voice of Indonesia
 Voice of Nigeria
 ZNBC Radio 2, Lusaka
2002
 Radio Botswana
2005
 Radio Pyongyang
2010
 China Radio Int'l*
 Radio New Zealand Int'l* [S-H]
2025
 Radiotelevisione Italiana
2030
 Christian Science Monitor [M-F]
 Radio Canada Int'l
 Radio Korea
 Radio Moscow
 Radio Nacional de Angola
2045
 BSKSA, Riyadh
2055
 Voice of Indonesia

2100 UTC **(5:00 PM EDT, 2:00 PM PDT)**

All India Radio
 BBC ("Newshour")
 CBC, Northern Quebec [S-F]
 China Radio Int'l
 Christian Science Monitor [M-A]
 Deutsche Welle
 GBC Radio 2, Accra*
 KVOH
 MBC, Blantyre
 Radio Australia
 Radio Iraq Int'l
 Radio Japan
 Radio Liberia
 Radio Moscow
 Radio New Zealand Int'l [S-H]
 Radio Nigeria
 Radio Norway Int'l [S]
 Radio Prague
 Radio Romania Int'l
 Radio Ukraine Int'l
 Radio Vlaanderen Int'l
 Radio Yugoslavia
 SLBS, Freetown
 Spanish National Radio
 Voice of America
 Voice of Kenya
 Voice of Turkey
 ZNBC Radio 2, Lusaka
2103
 Croatian Radio, Zagreb
2110
 China Radio Int'l*
 Radio New Zealand Int'l* [S-H]
2120
 Radio Cairo
 Radio For Peace Int'l [M-F]
2125
 Radio Havana Cuba* [M-A]
2130
 Christian Science Monitor [M-F]
 Kol Israel
 Radio Austria Int'l [M-F]
 Radio Cairo
 Radio Finland [S-F]
 Radio Havana Cuba [M-A]
 Radio Moscow
 Radio Tirana
 Radio Vilnius
2145
 Radio Bulgaria
 Radio Korea
 Radio Yerevan

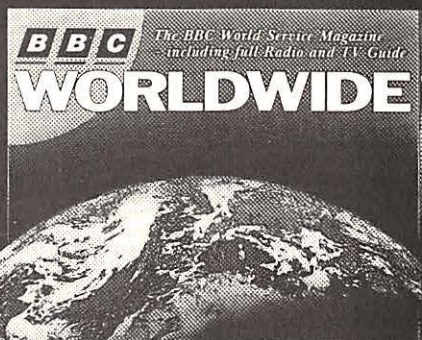
2200 UTC **(6:00 PM EDT, 3:00 PM PDT)**

All India Radio
 BBC
 CBC, Northern Quebec [M-F]
 China Radio Int'l
 Christian Science Monitor
 CIQX, Montreal [M-F]
 GBC Radio 2, Accra
 MBC, Blantyre
 Radio Australia
 Radio Canada Int'l
 Radio Havana Cuba [M-A]
 Radio Korea
 Radio Moscow
 Radio New Zealand Int'l [A-H]
 Radiotelevisione Italiana
 SBC Radio 1, Singapore
 SLBS, Freetown
 Swiss Radio Int'l
 Voice of America
 Voice of Free China
2209
 BBC*
2210
 China Radio Int'l*
2215
 Radio Cairo
2225
 Radio Havana Cuba* [M-A]
2230
 Christian Science Monitor [M-F]
 Radio Havana Cuba [M-A]
 Radio Moscow
 Voice of America (Special English)
2240
 Radio Cairo
 Radio Korea [M-F]
 Voice of Greece
2245
 GBC Radio, Accra
 Radio Yerevan

2300 UTC **(7:00 PM EDT, 4:00 PM PDT)**

All India Radio
 BBC
 CBC, Northern Quebec [A]
 Christian Science Monitor [M-A]
 Radio Australia
 Radio Canada Int'l [A-S]
 Radio Japan
 Radio Liberia
 Radio Moscow
 Radio New Zealand Int'l [A]
 Radio Norway Int'l [S]
 Radio Vilnius
 RTM, Malaysia
 SBC Radio 1, Singapore
 Voice of America
 Voice of Turkey
 WYFR (Network) [M-A]
2305
 Radio Pyongyang
2330
 Christian Science Monitor [M-F]
 Radio Moscow
 Radio Nacional, Bogota [A]
 Radio Netherlands
 Radio Vlaanderen Int'l
 RTM, Malaysia*
2335
 Voice of Greece
2345
 SLBC, Sri Lanka [M]
2350
 Radio For Peace Int'l [M-F]
2355
 Radio Japan [M-F]
 WRNO [W, F]

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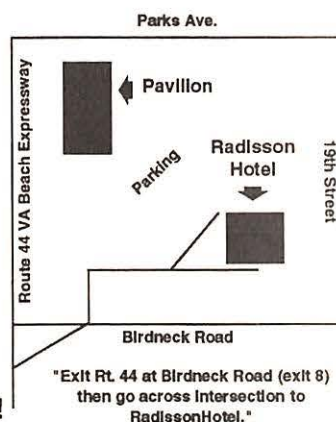
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0000 UTC

[8:00 PM EDT/5:00 PM PDT]

FREQUENCIES

0000-0100	Australia, ABC Brisbane	4920do	9660do		
0000-0100	Australia, ABC Perth	9610do			
0000-0030	Australia, Radio	5880pa	13605pa	15320pa	15365pa
		17750as	17840as		
0000-0100	Bulgaria, Radio	11720na	15330na		
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	China, China Radio Intl	9770na	11715na		
0000-0100	Costa Rica, AWR Alajuela	9725ca	11870ca		
0000-0100	Costa Rica, R for Peace Int	7375na	7385na	13630na	15030na
0000-0100 a	Croatian Radio via WHRI	7315na			
0000-0100	Cuba, Radio Havana Cuba	6010na	9815na		
0000-0030	Czech Republic, R Prague	5930na	7345na	9485na	9810na
		11990na	13715na	17535na	
0000-0045	India, All India Radio	9910as	11745as	11785as	15110as
		15145as			
0000-0100	Netherlands, Radio	6020na	6165na		
0000-0100	New Zealand, R NZ Intl	15120pa			
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na	
0000-0030 m	Norway, Radio Norway Intl	9675na	15165na		
0000-0100	Palau, KHBH Voice of Hope	9830as			
0000-0100	Philippines, FEBC Manila	15450as			
0000-0100	Russia, Radio Moscow Intl	7220na	7315am	7335na	9480na
		9530na	9625am	9765na	9815na
		9860na	9905na	11750na	11790na
		11805as	11840as	15410na	15425na
		15470na	15480as	15500as	15580as
		17570as	17720na	17835as	17860as
		21625as	21690as		
0000-0100	Singapore, SBC Radio One	5010do	5052do	11940do	
0000-0100	Spain, Spanish Natl Radio	9530am			
0000-0030	Switzerland, Swiss R Intl	6135na	9650na	9885na	12035na
		17730na			
0000-0100	Thailand, Radio	9655as	11905as		
0000-0100	Ukraine, R Ukraine Intl	6090eu	7150eu	7195eu	7240eu
		9500eu	9550eu	9560eu	9600eu

		9640na	9685na	9860eu	10344eu
		11720na	15195am		
0000-0030	United Kingdom, BBC London	5975na	6005sa	6175na	6180eu
		6195as	7325am	9570as	9580as
		9590na	9915am	11750sa	11945as
		11955as	12095na	15070na	15260sa
		15280na	15360pa		
0000-0100	USA, CS Monitor Boston MA	5850na	9850af	13760sa	17555as
0000-0100 sa	USA, CS Monitor Boston MA	17865as			
0000-0100	USA, KCBT Dallas TX	15725am			
0000-0100	USA, KTBH Salt Lk City UT	15590am			
0000-0100	USA, KVOH Los Angeles CA	17775am			
0000-0100	USA, VOA Washington DC	5995ca	6130ca	7215as	7405ca
		9455ca	9770as	9775ca	11580ca
		11695ca	11760as	15120ca	15185as
		15205ca	15290as	17735as	17820as
0000-0100	USA, WEWN Birmingham AL	7425na	15650na		
0000-0100	USA, WINB Red Lion PA	15145eu			
0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0100	USA, WRNO New Orleans LA		7355na		
0000-0100	USA, WWCR Nashville TN	7435va	13845va		
0000-0100	USA, WYFR Okeechobee FL	6085na			
0010-0015	Kirghizia, Kirghiz Radio	6080as			
0030-0100	Australia, Radio	11720pa	11880pa	13605pa	15240pa
		15320pa	15365pa	15510pa	17750as
		17795pa	17880as	21740pa	
0030-0100	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0030-0100	Iran, VOIRI Tehran	9022am	11790am	15260am	
0030-0100	Netherlands, Radio	6020na	6165na	9825as	9860as
		11655as	11835na	13700as	
0030-0100	Serbia, Radio Yugoslavia	9580na	11870na		
0030-0100	South Korea, Radio Korea	15575am			
0030-0100	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0030-0100	United Kingdom, BBC London	5975na	6005sa	6175na	6180eu
		7325am	9580as	9590am	9915am
		11750sa	12095na	15260sa	15310as
		15360pa			

SELECTED PROGRAMS

Sundays

- 0000 WWCR (Program Two): University Network Cathedral. Gene Scott presents his 24-hour-a-day talk show.
- 0000 WWCR: What Does The Bible Say? M.H. Reynolds presents an evangelical program.
- 0005 Swiss Radio Int'l: Grapvine. Listener letters and comment.
- 0018 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. Bob Thomann and Bob Zanotti present shortwave radio news and advice.
- 0030 BBC: (1st, 8th) The Ken Bruce Show. Ken Bruce plays the latest releases, from pop to jazz to country. (15th) Play of the Week "That Summer." (22nd, 29th) The John Dunn Show. Melody mix old and new.
- 0030 WWCR: Truth House Ministries. E.C. Fultcher presents an evangelical program.

Mondays

- 0000 WWCR (Program Two): University Network Cathedral. See S 0000.
- 0000 WWCR: Money Makes Money. See S 0430.
- 0005 Swiss Radio Int'l: Feature. See S 0605.
- 0030 BBC: In Praise Of God. Religious services from around the world.

Tuesdays

- 0000 WWCR (Program Two): University Network Cathedral. See S 0000.
- 0000 WWCR: Truth House Ministries. See S 0030.
- 0005 Swiss Radio Int'l: Dateline. See M 0605.
- 0030 BBC: Panel Game. Steve Race poses questions on all things musical in "My Music" (3rd).

Wednesdays

- 0000 WWCR (Program Two): University Network Cathedral. See S 0000.
- 0000 WWCR: Truth House Ministries. See S 0030.
- 0005 Swiss Radio Int'l: Dateline. See M 0605.

Special Closeout Sale!

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- 0030 BBC: Omnibus. Topical features on a range of topics, from Dracula to drugs.

Thursdays

- 0000 WWCR (Program Two): University Network Cathedral. See S 0000.
- 0000 WWCR: Truth House Ministries. See S 0030.
- 0005 Swiss Radio Int'l: Dateline. See M 0605.
- 0030 BBC: Comedy. See W 1530.

Fridays

- 0000 WWCR (Program Two): University Network Cathedral. See S 0000.
- 0000 WWCR: Truth House Ministries. See S 0030.
- 0005 Swiss Radio Int'l: Dateline. See M 0605.
- 0030 BBC: Musical Feature. Topical programming on various musical subjects.

Saturdays

- 0000 WWCR (Program Two): University Network Cathedral. See S 0000.
- 0000 WWCR: Truth House Ministries. See S 0030.
- 0005 Swiss Radio Int'l: Dateline. See M 0605.
- 0030 BBC: From The Weeklies. The best extracts from the week's newspapers and magazines.
- 0045 BBC: Recording Of The Week. See M 0615.

0100 UTC

[9:00 PM EDT/6:00 PM PDT]

FREQUENCIES

0100-0200	Australia, ABC Brisbane	4920do	9660do		
0100-0200	Australia, ABC Perth	9610do			
0100-0200	Australia, Radio	11880pa	15240pa	15320pa	15365pa
		15510pa	17715pa	17750as	17795pa
		17880as	21740pa		
0100-0200	Bulgaria, Radio	9700na			
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0159 sm	Canada, RCI Montreal	6120na	9535am	9755na	11845am
		11940am			
0100-0130 twhta	Canada, RCI Montreal	9535am	11845am	11940am	
0100-0200	Costa Rica, R for Peace Int	7375am	7385na	13630am	15030am
		21465am			
0100-0200	Cuba, Radio Havana Cuba	6010na	9815na		
0100-0130	Czech Republic, R Prague	7345na	9485na	11990na	
0100-0200	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9565na
		9700na	9765na	11810na	11865na
		13610na	13770na	15105na	
0100-0200	Guam, KSDA Agana	15610as			
0100-0130	Iran, VOIRI Tehran	9022am	11790am	15260am	
0100-0120	Italy, RAI Rome	9575am	11800am		
0100-0200	Japan, NHK/Radio Japan	5960na	11815as	11840as	11860as
		15195as	17775na	17810as	17845as
0100-0130	Laos, National Radio of	7116as			
0100-0200	Namibia, Namibia BC Corp	3290af			
0100-0130	Netherlands, Radio	6020na	6165na	11835na	
0100-0200	New Zealand, R NZ Intl	15120pa			
0100-0130 m	Norway, Radio Norway Intl	9560na			
0100-0200	Philippines, FEBC Manila	15450as			
0100-0200	Russia, Radio Moscow Intl	7335na	9480as	9530na	9765na
		9810na	9815eu	9840na	9860na
		9870na	9875na	11790na	11805as
		11905as	12050na	15385na	15410na
		15425na	15470na	17570na	17590na
		17655as	17720na	17835na	17860as
		17870na	21625as	21690as	21770as

0100-0200	Singapore, SBC Radio One	5010do	5052do	11940do	
0100-0127	Slovakia, R Slovakia Intl	5930am	7310am	9810am	
0100-0130	South Korea, Radio Korea	7550am	15575eu		
0100-0200	Spain, Spanish Natl Radio	9530am			
0100-0200	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0100-0130	Sweden, Radio	9695as	11820as		
0100-0200	Thailand, Radio	9655as	11905as		
0100-0130	United Kingdom, BBC London	5975na	6005sa	6175na	6180eu
		7325am	9590am	9915am	11750sa
		11955as	12095na	15260sa	15310as
		15360pa			
0100-0200	USA, CS Monitor Boston MA	5850na	9850af	13760sa	17555as
0100-0200 sa	USA, CS Monitor Boston MA	17865as			
0100-0200	USA, KCB Dallas TX	15725am			
0100-0200	USA, KTN Salt Lk City UT	7510na			
0100-0200	USA, KVOH Los Angeles CA	17775am			
0100-0200	USA, VOA Washington DC	5995am	6130am	7115as	7205as
		7405am	7651as	9455am	9775am
		11580am	11705as	15120am	15160as
		15205am	15250as	17740as	21550as
0100-0130	USA, WEWN Birmingham AL	7425as			
0100-0200	USA, WINB Red Lion PA	15145na			
0100-0200	USA, WJCR Upton KY	7490na	13595na		
0100-0200	USA, WRNO New Orleans LA		7355na		
0100-0200	USA, WWCR Nashville TN	7435va	13845am		
0100-0200	USA, WYFR Okeechobee FL	6065am	6085am	9505am	15440am
0100-0130	Uzbekistan, R Tashkent	7285as	9715as	15295as	17815as
0130-0200	Albania, R Tirana Intl	9580na	11840na		
0130-0200	Austria, R Austria Intl	6015na	9870sa	9880na	
0130-0140 mtwhfs	Greece, Voice of	9380na	9420na	11645na	
0130-0200	Netherlands, Radio	9860as	11655as	12025as	13700as
0130-0200 mtwhf	Portugal, Radio	9570na	9705na		
0130-0200	Serbia, Radio Yugoslavia	9580am			
0130-0200	Switzerland, Swiss R Intl	9885na			
0130-0200	United Kingdom, BBC London	5975na	6005na	6175na	6180eu
		7325am	9580am	9590na	9915am
		11750sa	11955as	12095na	15260sa
		15310as	15360pa	17790as	
0130-0200	USA, WHRI Noblesville IN	7315am			
0145-0200 smtwhf	Finland, Radio	11755na	15185na		
0145-0200	Vatican State, Vatican R	7125pa	9650as		

SELECTED PROGRAMS

Sundays

- 0100 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0100 WWCR Truth House Ministries. See S 0130.
 0101 BBC: Play Of The Week. (1st) Dylan Thomas' "Under Milk Wood" starring Richard Burton; (8th) Dylan Thomas' "Return Journey"; (22nd) "Noah"; (29th) "The Curse of the Pharaoh"
 0115 Radiotelevisione Italiana: Tunes For Whistling. Italian popular and jazz music.
 0130 WWCR: Lights Of Spiritual Guidance. J. Harold Lowman presents an evangelical program.

Mondays

- 0100 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0100 WWCR: Worldwide Christian Center. Paul Barkocy presents an evangelical program.
 0101 BBC: Feature. Nicky Campbell profiles the men and women behind top pop stars in "The Record Producers" (through September 13th).
 0115 Radiotelevisione Italiana: No Parking. Italian popular music.
 0145 BBC (as): South Asia Report. See S 0315.
 0145 BBC: Musical Feature. Jihad Racy travels the Middle East in search of "Arabian Sounds" (2nd, 9th, 16th, 23rd).

Tuesdays

- 0100 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0105 BBC: Outlook. See M 1405.

- 0105 WWCR: Point Of View. Marlin Maddoux presents an evangelical program.
 0115 Radiotelevisione Italiana: Light Music. Italian popular, jazz, and easy listening music.
 0130 BBC: Folk Routes. Ian Anderson presents a selection of roots music.
 0145 BBC (as): South Asia Report. See S 0315.
 0145 BBC: Health Matters. New medical developments and methods of keeping fit.

Wednesdays

- 0100 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0105 BBC: Outlook. See M 1405.
 0105 WWCR: Point Of View. See T 0105.
 0115 Radiotelevisione Italiana: Window On The Bay. Selections of Italian music.
 0130 BBC: Talks. Michael Rosen reads requested poems in "Poems By Post" (through October 6th).
 0145 BBC (as): South Asia Report. See S 0315.
 0145 BBC: Country Style. Selections of country music.

Thursdays

- 0100 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0105 BBC: Outlook. See M 1405.
 0105 WWCR: Point Of View. See T 0105.
 0115 Radiotelevisione Italiana: Light Music. See T 0115.

- 0130 BBC: Waveguide. See W 0415.
 0140 BBC: Book Choice. See W 0425.
 0145 BBC (as): South Asia Report. See S 0315.
 0145 BBC: The Farming World. An examination of agriculture, forestry, and fishing worldwide.

Fridays

- 0100 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0105 BBC: Outlook. See M 1405.
 0105 WWCR: Point Of View. See T 0105.
 0115 Radiotelevisione Italiana: Light Music. See T 0115.
 0130 BBC: On The Move. News from the world of travel and transport.
 0145 BBC (as): South Asia Report. See S 0315.
 0145 BBC: Global Concerns. An update on environmental issues.

Saturdays

- 0100 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0105 BBC: Outlook. See M 1405.
 0105 WWCR: Point Of View. See T 0105.
 0115 Radiotelevisione Italiana: Contrast In Music. Selections of Italian music.
 0130 BBC: Short Story. See S 0430.
 0145 BBC (as): South Asia Report. See S 0315.
 0145 BBC: Jazz Now And Then. George Reid presents a mix of new releases and classic tracks.

0200 UTC

[10:00 PM EDT/7:00 PM PDT]

FREQUENCIES

0200-0300 twhfa	Argentina, RAE	11710am			
0200-0300	Australia, ABC Brisbane	4920do	9660do		
0200-0300	Australia, ABC Perth	4910do	9610do	15425do	
0200-0300	Australia, Radio	11720pa	15240pa	15365pa	17715pa
		17750as	17795pa	17880as	21595as
		21740pa			
0200-0300	Bulgaria, Radio	15330na			
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0259	Canada, RCI Montreal	6120na	9535am	9755na	11845am
		11940am			
0200-0300	Costa Rica, R for Peace Int	7375na	7385na	13630na	15030na
0200-0300	Cuba, Radio Havana Cuba	6010na	13660na		
0200-0300	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0200-0300	Egypt, Radio Cairo	9475na	11825na		
0200-0210 smtwhf	Finland, Radio	11755na	15185na		
0200-0250	Germany, Deutsche Welle	7285as	9615as	9690as	11945as
		11965as	13790as	15185as	15560as
0200-0300 as	Guam, KSDA Agana	13720as			
0200-0300	Hungary, Radio Budapest	9835na	11910na		
0200-0300 vl	Italy, IRRS Milano	7125va			
0200-0230 mtwhfa	Kenya, Kenya BC Corp	4935do			
0200-0300 smtwh	Malaysia, RTM Radio 4	7295do			
0200-0300	Namibia, Namibia BC Corp	3290af			
0200-0300	Netherlands, Radio	9860as	11655as	12025as	13700as
0200-0300	New Zealand, R NZ Intl	15120pa			
0200-0230 m	Norway, Radio Norway Intl	9560na	11925na		
0200-0230	Philippines, FEBC Manila	15450as			
0200-0300	Romania, R Romania Intl	6155na	9510na	9570na	11830na
		11940na			
0200-0300	Russia, AWR Russia	11835eu			
0200-0300	Russia, Radio Moscow Intl	7150na	7335na	9480na	9530na
		9685na	9765na	9810na	11805na
		11840na	12050na	15220am	15375am
		15385am	15410na	15425na	15470am
		17560am	17570am	17590am	17640na
		17655as	17720na	17835am	17850na
		17860na	21625am	21690as	
0200-0300	S Africa, Channel Africa	5960af	9730af		
0200-0300	Singapore, SBC Radio One	5010do	5052do	11940do	
0200-0300	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0200-0230	Sweden, Radio	9695na	11705na		
0200-0230	Switzerland, Swiss R Intl	6135am	9650am	9885am	12035am
0200-0300	Taiwan, VO Free China	5950na	9680na	9765pa	11740ca
		11860as	15345na		
0200-0300	Thailand, Radio	9655as	11905as		
0200-0230	United Kingdom, BBC London	5975na	6005sa	6175na	6195eu
		7135me	7325am	9410eu	9590am
		9915am	11730af	11750sa	11955as
		12095na	15260sa	15310as	15360pa
		15380as	17790as	21715as	
0200-0300	USA, CSMonitor Boston MA	5850na	9350af	9455na	13760sa
0200-0300 sa	USA, CSMonitor Boston MA	17555as	17865as		
0200-0230	USA, KCBI Dallas TX	15375am			
0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0230	USA, KVOH Los Angeles CA	17775am			
0200-0230 twhfa	USA, VOA Washington DC	5995am	7405am	9775am	11580am
		15120am	15205am		
0200-0300	USA, VOA Washington DC	7115as	7205as	7651as	11705as
		15160as	15250as	17740as	21550as
0200-0300	USA, WHRI Noblesville IN	7315na			
0200-0300	USA, WINB Red Lion PA	15145eu			
0200-0300	USA, WJCR Upton KY	7490na	13595na		
0200-0300	USA, WWCR Nashville TN	5935am	7435va		
0200-0300	USA, WYFR Okeechobee FL	5985am	6065am	9505am	15440am
0205-0238	Honduras, La Voz Mosquitia	4911do			
0205-0230 tes-vl	Moldova, Natl R of Moldov	7125na			
0230-0300	Albania, R Tirana Intl	9580na	11840na		
0230-0300 vl	Iraq, Radio Iraq Intl	15180na	17940na		
0230-0300 s	Kenya, Kenya BC Corp	4935do			
0230-0245	Pakistan, Radio	9515as	17705as	17725as	21485as
		21730as			
0230-0300	Philippines, R Pilipinas	17760as	17840as	21580as	
0230-0300	United Kingdom, BBC London	5975na	6005sa	6175na	6195eu
		7135me	7325am	9410eu	9915am
		11730af	11750sa	11955as	11965na
		12095na	15260sa	15310as	15360pa
		17790as			
0245-0259	Armenia, Radio Yerevan	11790na			
0250-0300	Vatican State, Vatican R	9605na	11620na		

SELECTED PROGRAMS

Sundays

- 0200 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0200 WWCR: Gods Potpourri. An evangelical program from C.J. and company.
 0205 Swiss Radio Int'l: Grapevine. See S 0005.
 0218 Swiss Radio Int'l: Swiss SW Merry-Go-Round. See S 0018.
 0230 BBC: Feature. "The Odd Couple" examines the relationship between a deaf man and his interpreter (1st).
 0230 WWCR: Scriptures For America. Peter J. Peters presents an evangelical program.

Mondays

- 0200 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0200 WWCR: The Happening Network. Bill Goodman presents an evangelical program.
 0205 Swiss Radio Int'l: Feature. See S 0605.
 0230 BBC: Composer Of The Month: Felix Mendelsohn.

Tuesdays

- 0200 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0205 Swiss Radio Int'l: Dateline. See M 0605.
 0205 WWCR: Radio Free America. Tom Valentine presents live programming from the pirate radio station.
 0230 BBC: Quiz. See M 1215.

A Musical Favorite:
The Proms

Every Saturday at 1830 UTC, treat yourself to good music: the Henry Wood Promenade Concert season at the Royal Albert Hall, broadcast by the BBC. Additionally, the Proms can be heard at 1830 on Monday Aug 2; Tuesdays Aug. 10th and 31st; Thursday Aug. 26th; and Friday Aug. 20th. Tune up your receiver—the concert is about to begin!

Thank You!

Additional contributors to this month's Shortwave Guide:

Bob Fraser, Cohasset, MA; Ed Rausch, Cedar Grove, NJ; John Babbis, Silver Springs, MD; Dr. Adrian M. Peterson, Indianapolis, IN; Jim Frimmel, Ft. Worth, TX; Alfredo E. Cotroneo, NEXUS-IBA, Milano, Italy; LeRoy Long, Edmond, OK; BBC Monitoring Service; WWCR/World of Radio.

Wednesdays

- 0200 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0205 Swiss Radio Int'l: Dateline. See M 0605.
 0205 WWCR: Radio Free America. See T 0205.
 0230 BBC: Development '93. Aid and development issues for developing nations.

Thursdays

- 0200 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0205 Swiss Radio Int'l: Dateline. See M 0605.
 0205 WWCR: Radio Free America. See T 0205.
 0230 BBC: Sports International. Live play-by-play, interviews, features, and discussions from the sports world.

Fridays

- 0200 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0205 Swiss Radio Int'l: Dateline. See M 0605.
 0205 WWCR: Radio Free America. See T 0205.
 0230 BBC: Drama. See H 1130.

Saturdays

- 0200 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0205 Swiss Radio Int'l: Dateline. See M 0605.
 0205 WWCR: Radio Free America. See T 0205.
 0230 BBC: People And Politics. Background to the British political scene.

[11:00 PM EDT/8:00 PM PDT]

0300-0400	Australia, AAF Radio	19037af	23678as		
0300-0400	Australia, ABC Brisbane	4920do	9660do		
0300-0400	Australia, ABC Perth	9610do			
0300-0400	Australia, Radio	11720pa	11880pa	15240pa	15320pa
		15365pa	17715pa	17750as	17795pa
		17880pa	21595as	21740pa	
0300-0400	Bulgaria, Radio	9850na	11765na		
0300-0400	Canada, CFCX Montreal	6005do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030do			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	China, China Radio Intl	9690na	9770na	11715na	
0300-0400	Costa Rica, Faro del Carib	5055do			
0300-0400	Costa Rica, R forPeace Int	7375na	7385na	13630na	15030na
0300-0400	Cuba, Radio Havana Cuba	6010na	9655na	13660na	
0300-0330	Czech Republic, R Prague	5930na	7345na	9485na	9810na
		11990na			
0300-0400	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0300-0330	Egypt, Radio Cairo	9475na	11865na		
0300-0350	Germany, Deutsche Welle	6085na	6145na	9640na	9700na
		11810na	11890na	13610na	13770na
		13790na	15205na		
0300-0400	Guatemala, Radio Cultural	4300do			
0300-0400 m	Honduras, La Voz Evangel	4820do			
0300-0400 sm	Honduras, R Luz y Vida	3250ca			
0300-0400	Hungary, Radio Budapest	9835na	11910na	15220na	
0300-0400	Japan, NHK/Radio Japan	11725am	15210am	15230am	15325am
		17810am	21610am		
0300-0400	Kenya, Kenya BC Corp	4935do			
0300-0400 smtwh	Malaysia, RTM Radio 4	7295do			
0300-0330	Netherlands, Radio	9860as	11655as	12025as	13700as
0300-0400	New Zealand, R NZ Intl	15120pa			
0300-0330 m	Norway, Radio Norway Intl	9560na	11865na		
0300-0330	Philippines, R Pilipinas	17760as	17840as	21580as	
0300-0400	Russia, Radio Moscow Intl	7205na	9530na	9765na	9860na
		11665as	11790na	11840na	12070as
		15220as	15375as	15385na	15410na
		15425na	15470as	15535as	17560as
		17570as	17600as	17640as	17670as

		17685as 21690as	17735as	17850as	17860as
0300-0400	S Africa, Channel Africa	5960af	9730af		
0300-0400	S Africa, Radio Oranje	3230do			
0300-0400	Singapore, SBC Radio One	5010do	5052do	11940do	
0300-0400	Sri Lanka, SLBC Colombo	9720as	15425as		
0300-0400	Taiwan, VO Free China	5950na	9680na	9765as	11740as
0300-0400	Tanzania, Radio	5985af	9685af	11765af	
0300-0400	Thailand, Radio	9655as	11905as		
0300-0400	Turkey, Voice of	9445na			
0300-0330	United Kingdom,BBC London	3255af	5975na	6005va	6175na
		6180eu	6190af	6195me	7135me
		7230eu	7325am	9410eu	9600af
		9915am	11730af	11750sa	11760me
		11955me	12095as	15260sa	15310as
		15360pa	15380as	21715as	
0300-0400	USA, CSMonitor Boston MA	5850na	9350af	9455na	13760sa
0300-0400 sa	USA, CSMonitor Boston MA	17555as	17865as		
0300-0400	USA, KCBi Dallas TX	13720am			
0300-0400	USA, KTVN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9785sa			
0300-0400	USA, VOA Washington DC	6065af	7265af	7280af	7405af
		9575af	9665af	9885af	
0300-0400	USA, WEWN Birmingham AL	7425na			
0300-0400	USA, WHRI Noblesville IN	7315na			
0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400	USA, WRNO New Orleans LA		7395am		
0300-0400	USA, WWCN Nashville TN	5935am	7435am		
0300-0400	USA, WYFR Okeechobee FL	6065am	6085am	9505am	
0300-0345	Vatican State, Vatican R	9605na	11620na	11625af	
0330-0400	Austria, R Austria Intl	6015na	9870na	9880na	
0330-0400	Japan, NHK/Radio Japan	15210as	15320na		
0330-0400	Netherlands, Radio	6165na	9590na		
0330-0400	UAE, UAE Radio Dubai	11945na	13675na	15400eu	17890eu
0330-0400	United Kingdom,BBC London	3255af	5975na	6005af	6180eu
		6190af	6195eu	7230eu	9410eu
		9600af	11730af	11760me	11955me
		12095va	15280as	15310as	15420af
		21715as			
0340-0350 mtwhfa	Greece, Voice of	9380na	9420na	11645na	
0345-0400	Tajikistan, Radio	7245eu			

0300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
0300 WWCR: There's No Place like Home. A program from Paul Lindstrom.
0305 WWCR: World Of Radio. Glenn Hauser's communications program for shortwave radio listeners.
0315 BBC (as): South Asia Report. In-depth analysis of political, economic, and social developments in the subcontinent.
0315 BBC: Sports Roundup. News from the world of sports.
0330 BBC: From Our Own Correspondent. Reporters comment on the background to the news.
0335 BBC (af): Postmark Africa. Answers to any question under the sun.
0335 WWCR: Spectrum. A program from Mark Emmanuel.
0350 BBC: Write On. Listener letters, opinions, and questions.

0300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
0300 WWCR: The Happening Network. See M 0200.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Anything Goes. See S 1430.

0300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
0305 WWCR: Radio Free America. See T 0205.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: John Peel. Newly released albums and singles from the contemporary music scene.
0333 BBC (af): Network Africa. See M 0333.

0300 WWCN (Program 2): Univ Network Cathedral. See S 0000.
0305 WWCN: Radio Free America. See T 0205.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Pop Science. This month, Janice Long presents pop
selections and answers to science.
0333 BBC (af): Network Africa. See M 0333.

0300 WWCN (Program 2): Univ Network Cathedral. See S 0000.
0305 WWCN: Radio Free America. See T 0205.
0315 BBC: Sports Roundup. See S 0315.

0300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
0305 WWCR: Radio Free America. See T 0205.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Focus On Faith. Comment and discussion on major issues in the worlds of religion.
0333 BBC (af): Network Africa. See M 0333.

0300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
0305 WWCR: Radio Free America. See T 0205.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: The Vintage Chart Show. Paul Burnett presents
classic hits from the UK Top 20.
0335 BBC (af): This Week And Africa/News Quiz. The Saturday
edition of "Focus On Africa," with a radio game show.

0400 UTC

[12:00 AM EDT/9:00 PM PDT]

FREQUENCIES

0400-0500	Australia, AAF Radio	17900af				0400-0500	Singapore, SBC Radio One	5010do	5052do	11940do	
0400-0500	Australia, ABC Brisbane	4920do	9660do			0400-0430	Sri Lanka, SLBC Colombo	9720as	15425as		
0400-0500	Australia, ABC Perth	9610do				0400-0430	Switzerland, Swiss R Intl	6135na	9860na	9885na	12035na
0400-0500	Australia, Radio	11720pa	11880pa	15240pa	15320pa	0400-0430 mtwhf	Switzerland, Swiss R Intl	3985eu	6135eu	6165eu	9535eu
		15365pa	17715pa	17795pa	17840as	0400-0430	Tanzania, Radio	5985af	9685af	11765af	
		21595as	21740pa			0400-0430	Thailand, Radio	9655as	11905as		
		3356do	4830af	7255af		0400-0430	United Kingdom, BBC London	3955eu	5975na	6005af	6180eu
0400-0404	Botswana, Radio	6005do						6195eu	7230eu	9410eu	9600af
0400-0500	Canada, CFCX Montreal	6070do						11760me	11955me	12095va	15280as
0400-0500	Canada, CFRX Toronto	6030do				0400-0500	USA, CSMonitor Boston MA	15310va	15575va	21715as	
0400-0500	Canada, CFVP Calgary	6130do				0400-0500 sa	USA, CSMonitor Boston MA	9455am	9840af	13760sa	17780as
0400-0500	Canada, CHNX Halifax	6160do				0400-0500	USA, KCBI Dallas TX	17555as			
0400-0500	Canada, CKZU Vancouver	9650me	11905me	11925me	15275me	0400-0500	USA, KTNB Salt Lk City UT	13720am			
0400-0429	Canada, RCI Montreal	15445me				0400-0500	USA, KVOH Los Angeles CA	9785am			
		11680na	11840na			0400-0430	USA, VOA Washington DC	5995eu	6040eu	6065eu	6140eu
0400-0500	China, China Radio Intl	7375na	7385na	13630na	15030am			6155eu	6873eu	7170eu	7200eu
0400-0500	Costa Rica, R forPeace Int	7315na						7265af	7280eu	7405eu	7405eu
0400-0430	Croatian Radio via WHRI	6010na	6180am	9655na	13660na			9575eu	9885eu	11965eu	15205eu
0400-0430	Cuba, Radio Havana Cuba	7345na	9485na	9810na	11990na	0400-0500	USA, WEWN Birmingham AL	7425na			
0400-0430	Czech Republic, R Prague	13715af	17535sa			0400-0500	USA, WHRI Noblesville IN	7315na			
		9745am	15155am	17490am	21455am	0400-0500	USA, WJCR Upton KY	7490na	13595na		
0400-0450	Ecuador, HCJB Quito	6015af	6130af	6145af	7150af	0400-0500 smtwhf	USA, WMLK Bethel PA	9465eu			
	Germany, Deutsche Welle	7225af	9565af	9765af	11705af	0400-0500	USA, WRNO New Orleans LA	7395am			
		11765af	13610af	13770af		0400-0500	USA, WWCR Nashville TN	5935am	7435am		
						0400-0500	USA, WYFR Okeechobee FL	6065am	9505am		
0400-0430	Guatemala, Radio Cultural	3300do				0425-0440	Italy, RAI Rome	5990eu	7275me		
0400-0415	Israel, Kol Israel	9435na				0430-0500	Cuba, Radio Havana Cuba	6010na	6180na		
0400-0500	Kenya, Kenya BC Corp	4935do				0430-0450 s	Finland, Radio	6120eu	9665eu		
0400-0500	Lebanon, King of Hope	11530as				0430-0450	Finland, Radio	11755me	15440af		
0400-0500 smtwh	Malaysia, RTM Radio 4	7295do				0430-0500	Italy, AWR Europe	15125eu			
0400-0430	Netherlands, Radio	6165na	9590na			0430-0500	Nigeria, Radio	3326do	4770do		
0400-0500	New Zealand, R NZ Intl	15120pa				0430-0500	Russia, AWR Russia	15125eu			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as		0430-0500	Swaziland, Trans World R	5965af	9655af	11740af	
0400-0430 m	Norway, Radio Norway Intl	9655na	9740na			0430-0500	United Kingdom, BBC London	3955eu	5975na	6005af	6175eu
0400-0430	Romania, R Romania Intl	6155na	9510na	9570na	11830na			6180eu	6190af	6195eu	9410eu
		11940na						9600af	11760me	12095va	15280as
0400-0500	Russia, Radio Moscow Intl	7205na	7335na	9530na	9610eu	0430-0500	USA, VOA Washington DC	15310va	15325eu	15400af	15575va
		9750eu	9765eu	9860na	11790na			21470va	21715as		
		12050na	12070am	13650am	15180na			3980eu	5995eu	6040eu	6140eu
		15280na	15410na	15425na	15470na			6873eu	7170eu	7200eu	7265af
		15500na	15535na	17570as	17590as			7280af	9575af	15205eu	
		17605na	17850na	17860na	21690as	0435-0500 mtwhf	Namibia, Namibia BC Corp	4965af			
0400-0500	S Africa, Channel Africa	3995af	7230af			0445-0500 t	Sri Lanka, SLBC Colombo	9720na	15425na		
0400-0500 vi	S Africa, Radio Oranje	3230do				0455-0500	Nigeria, Voice of	7255af			

SELECTED PROGRAMS

Sundays

- 0400 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0400 WWCR: Spectrum. See S 0335.
 0405 Swiss Radio Int'l: Grapevine. See S 0005.
 0415 BBC (af): African Perspective. A look at a major issue affecting Africa.
 0415 BBC: Feature. Michael Diamond summarizes great books in "Mightier Than The Sword" (1st, 8th).
 0418 Swiss Radio Int'l: Swiss SW Merry-Go-Round. See S 0018.
 0430 BBC: (1st) Seeing Stars, a monthly look at astronomy. Short Story: (7th) "The Stuff of Dreams"; (14th) "The Hunter and the Pot"; (21st) "It's Lovely Finding Something You Didn't Know Where It Was"; (28th) Louie's Balloons"
 0430 WWCR: Money Makes Money. A program from Michael Papagiorgio.
 0445 BBC: Musical Feature. Party music from around the world is the fare on "Party, Party" (1st, 8th).

Mondays

- 0400 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0400 WWCR: Worldwide Torah Broadcast. Yakov Spivak presents an evangelical program.
 0405 Swiss Radio Int'l: Feature. See S 0605.
 0415 BBC (af): Network Africa. See M 0333.
 0415 BBC: Talks. Anna Horsburgh-Porter profiles powerful women in "The Power Behind The Throne" (2nd).
 0430 BBC: Off The Shelf. This month, hear the conclusion of Francois Mauriac's "A Women Of The Pharisees" (2nd-3rd).

- 0445 BBC: Andy Kershaw's World Of Music. New and unusual sounds from the world over.
 0450 BBC (af): World Business Report. See M 2305.

Tuesdays

- 0400 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0400 WWCR: The Hour Of The Time. William Cooper presents an evangelical program.
 0405 Swiss Radio Int'l: Dateline. See M 0605.
 0415 BBC (af): Network Africa. See M 0333.
 0415 BBC: Health Matters. See T 0145.
 0430 BBC: Off The Shelf. See M 0430.
 0445 BBC: On Screen. See M 2315.
 0450 BBC (af): World Business Report. See M 2305.

Wednesdays

- 0400 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0400 WWCR: The Hour Of The Time. See T 0400.
 0405 Swiss Radio Int'l: Dateline. See M 0605.
 0415 BBC (af): Network Africa. See M 0333.
 0415 BBC: Waveguide. Tips on how to hear the BBC better.
 0425 BBC: Book Choice. A short review of a recently released book.
 0430 BBC: Off The Shelf. See M 0430.
 0445 BBC: Country Style. See W 0145.
 0450 BBC (af): World Business Report. See M 2305.

Thursdays

- 0400 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0400 WWCR: The Hour Of The Time. See T 0400.
 0405 Swiss Radio Int'l: Dateline. See M 0605.
 0415 BBC (af): Network Africa. See M 0333.
 0415 BBC: The Farming World. See H 0145.
 0430 BBC: Off The Shelf. See M 0430.
 0445 BBC: From Our Own Correspondent. See S 0330.
 0450 BBC (af): World Business Report. See M 2305.

Fridays

- 0400 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0400 WWCR: The Hour Of The Time. See T 0400.
 0405 Swiss Radio Int'l: Dateline. See M 0605.
 0415 BBC (af): Network Africa. See M 0333.
 0415 BBC: Musical Feature. See M 0145.
 0430 BBC: Off The Shelf. See M 0430.
 0445 BBC: Folk Routes. See T 0130.
 0450 BBC (af): World Business Report. See M 2305.

Saturdays

- 0400 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0400 WWCR: The Hour Of The Time. See T 0400.
 0405 Swiss Radio Int'l: Dateline. See M 0605.
 0415 BBC (af): TalkAbout Africa. Discussion of events from the week just past.
 0415 BBC: Good Books. See W 1445.
 0430 BBC: Jazz Now And Then. See A 0145.
 0445 BBC: Worldbrief. See F 2315.

0500 UTC

[1:00 AM EDT/10:00 PM PDT]

FREQUENCIES

0500-0600	Australia, ABC Brisbane	4920do	9660do		
0500-0600	Australia, ABC Perth	9610do			
0500-0530	Australia, Radio	11720pa	11880pa	15240pa	15320pa
		15365pa	17715pa	17795pa	17880as
		21525as	21595as	21740pa	
0500-0530	Canada, Can Force Network	6150eu			
0500-0505	Canada, CBC Northern Svc	9625am			
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0529 mtwhf	Canada, RCI Montreal	6050eu	6150eu	7295eu	9750eu
		11775eu	17840eu		
0500-0600	Costa Rica, R for Peace Int	7375na	7385na	13630na	15030na
0500-0515	Croatian Radio via WHRI	7315na	9495na		
0500-0600	Cuba, Radio Havana Cuba	6180na	9510na		
0500-0600	Ecuador, HCJB Quito	11925am	21455am		
0500-0550	Germany, Deutsche Welle	5960na	6130na	9515na	9605na
		9670na	11705na	13610na	
0500-0600 vl	Italy, IRRS Milano	7125va			
0500-0600	Japan, NHK/Radio Japan	6085me	7230eu	9725me	11725am
		11740am	15230na	15410am	17810am
0500-0600	Kenya, Kenya BC Corp	4935do			
0500-0600 vl	Kiribati, Radio	17440do			
0500-0600	Lebanon, King of Hope	11530as			
0500-0505	Lesotho, Radio Lesotho	4800do			
0500-0600	Malaysia, RTM Radio 4	7295do			
0500-0600 mtwhf	Namibia, Namibia BC Corp	3270af	3290af		
0500-0600	New Zealand, R NZ Intl	15120pa			
0500-0600	Nigeria, Radio	3326do	4770do	4990do	
0500-0600	Nigeria, Voice of	7255af			
0500-0600	Russia, Radio Moscow Intl	9750eu	9765eu	11690eu	11790eu
		12050na	13650af	15180na	15280na
		15410na	15425na	15470na	15500na
		15540af	15590af	17560af	17570as
		17590as	17605as	17635as	17675as
		17830as	17860af	17880as	21690as
0500-0600	S Africa, Channel Africa	9695af			
0500-0553 f	Seychelles, FEBA Radio	17750me			
0500-0600	Singapore, SBC Radio One	5052do	11940do		
0500-0600	Spain, Spanish Natl Radio	9530am			
0500-0515 t	Sri Lanka, SLBC Colombo	9720na	15425na		
0500-0530	Swaziland, Trans World R	5965af	9655af	11740af	
0500-0515 mtwhf	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	

0500-0600	Thailand, Radio	9655as	11905as		
0500-0530	United Kingdom, BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	9410va
		9600af	9640na	11760me	12095va
		15070me	15280as	15310va	15360va
		15400af	15420af	15575va	17830va
		17885af	21470va	21715as	
0500-0600	USA, CS Monitor Boston MA	9455na	9840af	13760sa	17780as
0500-0600 sa	USA, CS Monitor Boston MA	1755as			
0500-0600	USA, KCBI Dallas TX	13720am			
0500-0600	USA, KTNB Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	9785am			
0500-0530	USA, VOA Washington DC	3980eu	5995eu	6040eu	6140eu
		6873eu	7170eu	9530eu	9700eu
		11825eu	11965eu	15205eu	
0500-0600	USA, VOA Washington DC	6035af	7405af	9665af	12080af
0500-0600	USA, WHRI Noblesville IN	7315na	9495na		
0500-0600	USA, WINB Red Lion PA	15145eu			
0500-0600	USA, WJCR Upton KY	7490na	13595na		
0500-0600 mtwhfa	USA, WMLK Bethel PA	9465eu			
0500-0600	USA, WRNO New Orleans LA	7395am			
0500-0600	USA, WWCR Nashville TN	5935am	7435am		
0500-0600	USA, WYFR Okeechobee FL	5985am	11580eu	11725eu	13695eu
0500-0520	Vatican State, Vatican R	6245eu	7250eu	11730af	
0510-0520 mtwhfa	Botswana, Radio	3356af	4830af	7255af	
0510-0600 vl	S Africa, Radio Oranje	7270do			
0524-0600 f	Ghana, GBC Radio 2	3366do			
0525-0600	Ghana, GBC Radio 1	4915do			
0530-0600	Australia, Radio	15240pa	15320pa	15365pa	17670as
		17715pa	17795pa	21525pa	21740pa
0530-0600	Austria, R Austria Intl	6015na			
0530-0600	Romania, R Romania Intl	15380af	17720af	17745af	17790af
0530-0600	Swaziland, Trans World R	5965af	11740af		
0530-0600	UAE, UAE Radio Dubai	15435as	17830as	21700as	
0530-0600	United Kingdom, BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	9410va
		9600af	9640na	9750eu	11760me
		12095va	15070me	15280as	15310va
		15360va	15400af	15420af	15575va
		17830va	17885af	21470va	21715as
0530-0600	USA, VOA Washington DC	5995me	6035eu	6040me	6140me
		6873me	7170me	7200me	7405eu
		9665me	11965me	12080me	15205me

SELECTED PROGRAMS

Sundays

- 0500 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0500 WWCR: Money Makes Money. See S 0430.
 0530 WWCR: Lutheran Reformation Hour. Richard Shekner presents an evangelical program.

Mondays

- 0500 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0500 WWCR: The Sower. Michael Guido presents an evangelical program.
 0515 WWCR: The Overcomer Ministry. R.G. Stair presents an evangelical program.
 0530 BBC (eu): Europe Today. The latest news, analysis, and comment for the new Europe.

Tuesdays

- 0500 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0500 WWCR: Herald Of Truth. Paul Haulstrom presents an evangelical program.
 0515 WWCR: The Overcomer Ministry. See M 0515.
 0530 BBC (eu): Europe Today. See M 0530.

Wednesdays

- 0500 WWCR (Program 2): Univ Network Cathedral. See S 0000.



Anne Blair Gould, "Research File" Producer and Presenter for Radio Netherlands.

- 0500 WWCR: Herald Of Truth. See T 0500.
 0515 WWCR: The Overcomer Ministry. See M 0515.
 0530 BBC (eu): Europe Today. See M 0530.

Thursdays

- 0500 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0500 WWCR: Herald Of Truth. See T 0500.
 0515 WWCR: The Overcomer Ministry. See M 0515.
 0530 BBC (eu): Europe Today. See M 0530.

Fridays

- 0500 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0500 WWCR: Herald Of Truth. See T 0500.
 0515 WWCR: The Overcomer Ministry. See M 0515.
 0530 BBC (eu): Europe Today. See M 0530.

Saturdays

- 0500 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0500 WWCR: Herald Of Truth. See T 0500.
 0515 WWCR: The Baptist Hour. An evangelical program from Southern Baptist.
 0530 BBC (eu): Europe Today. See M 0530.
 0545 WWCR: Words Of Hope. Paul Bryson presents an evangelical program.

0600 UTC

[2:00 AM EDT/11:00 PM PDT]

FREQUENCIES

0600-0700	Australia, ABC Brisbane	9660do				0600-0615	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
0600-0700	Australia, ABC Perth	15425pa				0600-0630	Switzerland, Swiss R Intl	13635af	15430af	17565af	
0600-0630	Australia, Radio	15240pa	15320pa	15365pa	17670bb	0600-0700 sa	Thailand, Radio	9655as	11905as		
	17715pa	17760as	17880as	21525pa	21595pa	0600-0630	United Kingdom, BBC London	3955eu	5975na	6180eu	6195eu
0600-0700	Canada, CFCX Montreal	6005do					7150pa	9410eu	9640va	11940af	11955as
0600-0700	Canada, CFRX Toronto	6070do					15070va	15280as	15310as	15360as	15400af
0600-0700	Canada, CFVP Calgary	6030do					15575me	17790as	17830va	21470me	21715as
0600-0700	Canada, CHNX Halifax	6130do				0600-0700	USA, CSMonitor Boston MA	5850eu	9455na	9840eu	17555as
0600-0700	Canada, CKZU Vancouver	6160do						17780as			
0600-0700	Costa Rica, R forPeace Int	7375na	7385na	13630am	15030na	0600-0700	USA, KCBI Dallas TX	13720am			
0600-0700	Cuba, Radio Havana Cuba	6000na	9510na			0600-0700	USA, KTNB Salt Lk City UT	7510na			
0600-0630	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu	0600-0700	USA, KVOH Los Angeles CA	9785na			
0600-0700	Ecuador, HCJB Quito	11925am	15155am	21455am		0600-0700	USA, VOA Washington DC	3980eu	5995me	6005me	6035af
0600-0630	Georgia, Georgian Radio	11805.3					6040me	6060eu	6095eu	6140eu	6873eu
0600-0650	Germany, Deutsche Welle	11780af	13610af	13770af	13790af	0600-0700	7325eu	7405af	9530af	9575af	9665af
		15185af	15205af	17875af			11925af	11965eu	12080af	15600af	11805eu
0600-0700	Ghana, GBC Radio 1	4915do				0600-0700	USA, WEWN Birmingham AL	7425na	13710na		
0600-0700 f	Ghana, GBC Radio 2	3366do				0600-0700	USA, WHRI Noblesville IN	7315eu	9495am		
0600-0700 vl	Italy, IRRS Milano	7125va				0600-0700	USA, WJCR Upton KY	7490na	13595na		
0600-0700	Japan, NHK/Radio Japan	11860as	15325as	21610as		0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
0600-0625	Kenya, Kenya BC Corp	4935do				0600-0700	USA, WWCR Nashville TN	5935am	7435am		
0600-0700 vl	Kiribati, Radio	17440do				0600-0700	USA, WYFR Okeechobee FL	5985am	7355eu	11580af	11725eu
0600-0630	Laos, National Radio of	7116as						13695eu	15666eu		
0600-0630 s	Latvia, Radio Riga	5935eu				0600-0610 mtwhfa	Vatican State, Vatican R	6245eu	7250eu	9645eu	11740eu
0600-0700	Lebanon, King of Hope	6280me						15210eu			
0600-0700 smtwha	Malaysia, RTM Radio 4	7295do				0603-0610	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0600-0700	Malaysia, Voice of	6175as	9750as	15295as		0615-0630	United Kingdom, BBC London	9510eu	11680eu	11845eu	13660eu
0600-0700	Malta, V of Mediterranean	9765eu						15325eu	17695eu		
0600-0700	Namibia, Namibia BC Corp	6175af				0625-0700	Kenya, Kenya BC Corp	4935do			
0600-0658	New Zealand, R NZ Intl	15120pa				0630-0700	Australia, Radio	11880pa	15240pa	15320pa	15365pa
0600-0700 s	New Zealand, ZLXA	3935do					17670as	17715pa	17880as	21525as	21590as
0600-0700	Nigeria, Radio	3970do	4770do				21740pa				21595as
0600-0700	Nigeria, Voice of	7255af				0630-0700	Austria, R Austria Intl	6015na			
0600-0650	North Korea, R Pyongyang	15180as	15230as			0630-0655	Belgium, R Vlaanderen	5910eu	9925eu		
0600-0630	Romania, R Romania Intl	7225eu	9510eu	9665eu	11810eu	0630-0700 smtwhf	New Zealand, ZLXA	3935do			
0600-0700	Russia, Radio Moscow Intl	9750eu	9765eu	11765am	11985na	0630-0700	United Kingdom, BBC London	5975na	6180eu	6195eu	7150pa
	12010af	12050af	12055am	12070eu	13650na		9410eu	9640va	11760me	11955as	12095me
	15140na	15180na	15425na	15470na	15500na		15280as	15310as	15360as	15400af	15575me
	17560am	17595am	17605na	17860am	15540am		17790as	17830pa	17885va	21470me	21715as
0600-0700	S Africa, Channel Africa	15220af	17710af				Vatican State, Vatican R	11625af	15090af	17730af	
0600-0700 vl	S Africa, Radio Oranje	9630do				0632-0641	Romania, R Romania Intl	7225eu	9510eu	9665eu	11810eu
0600-0608 f	Seychelles, FEBA Radio	17750me				0640-0700	Monaco, TWR Monte Carlo	9480eu			
0600-0700	Singapore, SBC Radio One	5010do	5052do	11940do		0645-0700	Finland, Radio	6120eu	9560eu	11755eu	
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do				Ghana, GBC	6130af			
0600-0700	South Korea, Radio Korea	7275na	11945na	15155na		0645-0715	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
0600-0700	Swaziland, Trans World R	5965af	11740af					17805pa			
						0650-0700 vl	S Africa, Radio Oranje	9630do			

SELECTED PROGRAMS

Sundays

- 0600 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0605 BBC (af): Postmark Africa. See S 0335.
 0605 Swiss Radio Int'l: Feature. Programs rotate: "Supplement" (news analysis), "Roundabout Switzerland" (travel/discovery), "Swiss Music," and "The Name Game" (game show).
 0605 WWCR: Ever-Increasing Faith. Fred Price evangelist.
 0615 BBC: Letter From America. Alistair Cooke shares his intimate view of American life.
 0630 BBC (af): African Perspective. See S 0415.
 0630 BBC: Jazz For The Asking. Digby Fairweather plays requests.
 0636 Radio Vlaanderen Int'l: P Box 26. Letters and questions.
 0649 Radio Vlaanderen Int'l: Music From Flanders. Musical filler.

Mondays

- 0600 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0600 WWCR: The Overcomer Ministry. See M 0515.
 0602 BBC (af): Network Africa. See M 0333.
 0605 Swiss Radio Int'l: Dateline. Analysis on world events.
 0615 BBC: Recording Of The Week. Classical music releases.
 0630 BBC (af): Network Africa. See M 0333.
 0630 BBC: Feature. See S 1401.
 0634 Radio Vlaanderen Int'l: Press Review. Belgian press review.
 0637 Radio Vlaanderen Int'l: Radio World. Frans Vossen presents news for shortwave enthusiasts.
 0647 Radio Vlaanderen Int'l: Tourism In Flanders. Things to see and do in Belgium.

Tuesdays

- 0600 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0600 WWCR: The Overcomer Ministry. See M 0515.

- 0602 BBC (af): Network Africa. See M 0333.
 0605 Swiss Radio Int'l: Dateline. See M 0605.
 0615 BBC: The World Today. See M 1645.
 0630 BBC (af): Network Africa. See M 0333.
 0630 BBC: Rock/Pop Music. Ranking Miss P provides the lowdown on reggae in "The Essential Guide To Music" (3rd).
 0634 Radio Vlaanderen Int'l: Press Review. See M 0634.
 0637 Radio Vlaanderen Int'l: Belgium Today. See M 2337.
 0642 Radio Vlaanderen Int'l: Focus On Europe. See M 2342.
 0647 Radio Vlaanderen Int'l: Sports. See M 2347.

Wednesdays

- 0600 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0600 WWCR: The Overcomer Ministry. See M 0515.
 0602 BBC (af): Network Africa. See M 0333.
 0605 Swiss Radio Int'l: Dateline. See M 0605.
 0615 BBC: The World Today. See M 1645.
 0630 BBC (af): Network Africa. See M 0333.
 0630 BBC: Meridian. Events in the world of the arts.
 0634 Radio Vlaanderen Int'l: Press Review. See M 0634.
 0637 Radio Vlaanderen Int'l: Belgium Today. See M 2337.
 0642 Radio Vlaanderen Int'l: Around The Arts. See T 2342.
 0647 Radio Vlaanderen Int'l: P Box 26. See S 0636.

Thursdays

- 0600 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0600 WWCR: The Overcomer Ministry. See M 0515.
 0602 BBC (af): Network Africa. See M 0333.
 0605 Swiss Radio Int'l: Dateline. See M 0605.
 0615 BBC: The World Today. See M 1645.
 0630 BBC (af): Network Africa. See M 0333.

- 0630 BBC: Sports International. See H 0230.
 0634 Radio Vlaanderen Int'l: Press Review. See M 0634.
 0637 Radio Vlaanderen Int'l: Belgium Today. See M 2337.
 0642 Radio Vlaanderen Int'l: Living In Belgium. See W 2342.
 0647 Radio Vlaanderen Int'l: Green Society. See W 2347.

Fridays

- 0600 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0600 WWCR: The Overcomer Ministry. See M 0515.
 0602 BBC (af): Network Africa. See M 0333.
 0605 Swiss Radio Int'l: Dateline. See M 0605.
 0615 BBC: The World Today. See M 1645.
 0630 BBC (af): Network Africa. See M 0333.
 0630 BBC: Meridian. See W 0630.
 0634 Radio Vlaanderen Int'l: Press Review. See M 0634.
 0637 Radio Vlaanderen Int'l: Belgium Today. See M 2337.
 0642 Radio Vlaanderen Int'l: Economics. See H 2342.
 0650 Radio Vlaanderen Int'l: North-South. See H 2350.

Saturdays

- 0600 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 0605 BBC (af): This Week And Africa/News Quiz. See A 0335.
 0605 Swiss Radio Int'l: Grapevine. See S 0005.
 0615 BBC: The World Today. See M 1645.
 0618 Swiss Radio Int'l: Swiss SW Merry-Go-Round. See S 0018.
 0630 BBC (af): Spice Taxi. A look at African culture.
 0630 BBC: Meridian. See W 0630.
 0634 Radio Vlaanderen Int'l: Press Review. See M 0634.
 0637 Radio Vlaanderen Int'l: Radio World. See M 0637.
 0647 Radio Vlaanderen Int'l: Tourism In Flanders. See M 0647.

0700 UTC [3:00 AM EDT/12:00 AM PDT]

0700-0800	Australia, ABC Brisbane	9660do			
0700-0800	Australia, ABC Perth	15425pa			
0700-0730	Australia, Radio	6020pa	11720va	11880pa	15240pa
	15320pa	15365pa	17695pa	17715pa	17750as
	21525as	21595as	21740pa		
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica, R forPeace Int	7375na	7385na	13630na	15030na
0700-0730	Ecuador, HCJB Quito	9600eu	11835eu	11925am	15270am
		17490am	21455eu		
0700-0800	Ghana, GBC	6130af			
0700-0800	Ghana, GBC Radio 1	4915do			
0700-0800 f	Ghana, GBC Radio 2	3366do			
0700-0800 vl	Italy, IRRS Milano	7125va			
0700-0800	Japan, NHK/Radio Japan	6050as	7230au	11740au	15170as
	15325au	15410au	17765as	17810as	17860as
0700-0800	Kenya, Kenya BC Corp	4935do			
0700-0800 vl	Kiribati, Radio	17440do			
0700-0800	Lebanon, King of Hope	6280me			
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0800	Monaco, TWR Monte Carlo	9480eu			
0700-0800	New Zealand, R NZ Intl	9700pa			
0700-0800 smtwhf	New Zealand, ZLXA	3935do			
0700-0800	Nigeria, Radio	3326do	4990do		
0700-0750	North Korea, R Pyongyang	15340as	17765as		
0700-0715	Romania, R Romania Intl	11810pa	11940pa	15335pa	17720pa
		17805pa	21665pa		
0700-0800	Russia, AWR Russia	11835eu			
0700-0800	Russia, Radio Moscow Intl	7345eu	9750eu	12020af	12070af
	13650me	13705am	15125me	15190af	15225am
	15280af	15345af	15420me	15440eu	15465af
	15520af	15540am	15550af	17560af	17570af
	17655af	17660am			
	17735am	21690af			
0700-0800 vl	S Africa, Radio Oranje	9630do			
0700-0800	Singapore, SBC Radio One	5010do	5052do	11940do	
0700-0800	Swaziland, Trans World R	7200af	11740af		
0700-0800	Taiwan, VO Free China	5950na			
0700-0800 sa	Thailand, Radio	9655as	11905as		
0700-0730	United Kingdom, BBC London	5975na	6190af	6195eu	7150pa
	7325af	9410eu	9640eu	9760eu	11940af
	11950eu	11955as	12095me	15070va	15280as
	15325eu	15360pa	15400af	15420va	15575va
	17790va	17830as	17885af	21470me	21660af
0700-0800	USA, CSMonitor Boston MA	5850eu	7395am	9445na	9455am
	9840va	9870am	17555as	17780as	
0700-0800	USA, KCBI Dallas TX	13720am			
0700-0800	USA, KTNB Salt Lk City UT	7510na			
0700-0800	USA, KVOH Los Angeles CA	9785na			
0700-0800	USA, WEWN Birmingham AL	9350am	11580am		
0700-0800	USA, WHRI Noblesville IN	7315eu	9495am		
0700-0800	USA, WJCR Upton KY	7490na	13595na		
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800	USA, WWCR Nashville TN	5935am			
0700-0800	USA, WYFR Okeechobee FL	5985va	7355va	9680va	11915af
		13695eu			
0703-0715	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0730-0800	Australia, Radio	6020pa	11720pa	11880pa	17695pa
		17750as	21595pa	21750as	25750pa
0730-0800	Austria, R Austria Intl	6155eu	13730eu	15450me	17870me
0730-0757	Czech Republic, R Prague	6055eu	11990pa	13600as	17535pa
		17725as	21705pa		
0730-0800	Ecuador, HCJB Quito	9745pa	11835eu	11925pa	15270eu
		17490eu	21455eu		
0730-0745 mtwhf	Iceland, Natl BC Service	9265om			
0730-0800	Italy, AWR Europe	7210eu			
0730-0800	Netherlands, Radio	9630pa	11895pa		
0730-0800	United Kingdom, BBC London	5975na	6190af	6195eu	7150au
	7325eu	9410eu	9640au	9760eu	11760me
	12095me	15070va	15280as	15310as	15360as
	15420va	15575me	17640me	17790va	17830as
	21470me	21660af	21715as		

0800 UTC [4:00 AM EDT/1:00 AM PDT]

0800-0900	Australia, ABC Brisbane	9660do			
0800-0900	Australia, ABC Perth	15425do			
0800-0830	Australia, Radio	5995pa	6020pa	6080pa	9580pa
	15240pa	17695pa	17750pa	21595as	25750as
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	Costa Rica, R forPeace Int	13630am	15030na		
0800-0830	Ecuador, HCJB Quito	9600eu	9745pa	11835eu	11925pa
		17490au	21455eu		
0800-0900	Finland, Radio	17800as	21550as		
0800-0900	Ghana, GBC Radio 1	4915do			
0800-0900 f	Ghana, GBC Radio 2	3366do			
0800-0900 asmtwh	Guam, KTWR Agana	15200as			
0800-0900	Indonesia, Voice of	11752as			
0800-0900 vl	Italy, IRRS Milano	7125va			
0800-0900	Kenya, Kenya BC Corp	4935do			
0800-0830 vl	Kiribati, Radio	17440do			
0800-0900	Lebanon, King of Hope	6280me			
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295as	
0800-0845	Monaco, TWR Monte Carlo	9480eu			
0800-0825	Netherlands, Radio	9630pa	11895pa		
0800-0900	New Zealand, R NZ Intl	9700pa			
0800-0900 smtwhf	New Zealand, ZLXA	3935do			
0800-0900	Nigeria, Radio	3326do	4990do		
0800-0900	Nigeria, Voice of	7255af			
0800-0850	North Korea, R Pyongyang	15180as	15230as		
0800-0845	Pakistan, Radio	17900eu	21520eu		
0800-0900 vl	Papua New Guinea, NBC	4890do			
0800-0900	Russia, Radio Moscow Intl	11765af	12010as	12020as	12055af
	12070as	13650as	15125me	15190eu	15225as
	15420as	15440me	15470as	17560af	17645af
	17675af	17735am	17760am	17805af	17890am
	21690am				
0800-0900 vl	S Africa, Radio Oranje	9630do			
0800-0900	Singapore, SBC Radio One	5010do	5052do	11940do	
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, Radio Korea	7550af	13670eu	15155eu	
0800-0820	Swaziland, Trans World R	7200af	11740af		
0800-0830	United Kingdom, BBC London	6190af	7325eu	9410eu	9640eu
	9660eu	9760eu	11940af	11955as	12095me
	15280as	15360as	15400am	15420af	15575af
	17705eu	17790af	17790af	17830as	17885af
	21660af	21715pa			
0800-0900	USA, CSMonitor Boston MA	9455sa	9840eu	13615pa	15665pa
		17555as			
0800-0900	USA, KCBI Dallas TX	9815am			
0800-0900	USA, KNLS Anchor Point AK	9615as			
0800-0900	USA, KTNB Salt Lk City UT	7510am			
0800-0900	USA, WEWN Birmingham AL	9350am			
0800-0900	USA, WHRI Noblesville IN	7315am			
0800-0900	USA, WJCR Upton KY	7490na	13595na		
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0800-0900	USA, WWCR Nashville TN	5935am			
0803-0805	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0820-0835 as	Swaziland, Trans World R	7200af	11740af		
0830-0900	Australia, Radio	5995na	9560pa	9580pa	17695pa
		21595pa	25750pa		
0830-0900 vl	Australia, VL8A Alice Spg	2310do			
0830-0900 vl	Australia, VL8K Katherine	2485do			
0830-0900 vl	Australia, VL8T Tent Crk	2325do			
0830-0900	Austria, R Austria Intl	6155eu	13730eu		
0830-0900	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
0830-0900	Netherlands, Radio	11895pa			
0830-0857	Slovakia, R Slovakia Intl	11990au	15605au	17535au	21705au
0830-0900	United Kingdom, BBC London	6190af	7325eu	9410eu	9600eu
	9760eu	11940af	11955as	12095me	15070va
	15360pa	15420af	15575af	17640me	17705eu
	17790af	17830as	17885af	21470af	21660af
					21715pa
0830-0845	Vatican State, Vatican R	6245eu	7250eu	9645eu	15210eu
0835-0845 smtwhf	Monaco, TWR Monte Carlo	9480eu			
0840-0850	Greece, Voice of	15650au	17525au		
0850-0900 s	Monaco, TWR Monte Carlo	9480eu			

0900 UTC [5:00 AM EDT/2:00 AM PDT]

0900-1000	Australia, ABC Brisbane	4920do	9660do		
0900-0950	Australia, AAF Radio	20418af	25322as		
0900-1000	Australia, Radio	5995pa	6020pa	6080pa	9510pa
		9580pa	9710pa	13605pa	15170as
		21725as			
0900-1000 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8K Katherine	2485do			
0900-1000 vl	Australia, VL8T Tent Crk	2325do			
0900-0925 mtwhf	Belgium, R Vlaanderen	5910eu	9905eu	13675eu	
0900-1000 s	Bhutan, BC Service	6035do			
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	11755au	15440au	17710au	
0900-1000	Costa Rica, R forPeace Int	7375am	7385am	13630am	15030am
0900-1000	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
0900-0950	Germany, Deutsche Welle	6160as	9565af	11715as	15410af
		17780as	17800af	17820as	21465as
		21600af	21650as	21680as	
0900-0905	Ghana, GBC Radio 1	4915do			
0900-0905 f	Ghana, GBC Radio 2	3366do			
0900-1000	Guam, KTWB Agana	11805pa			
0900-1000 s	Italy, AWR Europe	7230eu			
0900-1000 vl	Italy, IRRS Milano	7125va			
0900-1000	Japan, NHK/Radio Japan	9750pa	11740pa	11815pa	11910pa
		15190pa	17860au		
0900-1000	Kenya, Kenya BC Corp	4935do			
0900-1000	Lebanon, King of Hope	6280me			
0900-1000	Malaysia, RTM Radio 4	7295do			
0900-0915 s	Monaco, TWR Monte Carlo	9480eu			
0900-1000	New Zealand, R NZ Intl	9700pa			
0900-0930 mtwhf	New Zealand, ZLXA	3935do			
0900-1000	Nigeria, Radio	3326do	4990do		
0900-1000	Nigeria, Voice of	7255af			
0900-0930 mtwhf	Palau, KHBN Voice of Hope	9830as			
0900-1000 vl	Papua New Guinea, NBC	4890do			
0900-1000	Philippines, FEBC Manila	11690as			
0900-1000	Russia, Radio Moscow Intl	7130af	9755af	11765af	12010as
		12020as	12055af	12070as	13650as
		15190eu	15345me	15420as	15440af
		15470as	15490af	15525as	17560af
		17645af	17660af	17675af	17735am
		17760am	17805af	17890af	21655af
		21690am	21825af		
0900-1000 vl	S Africa, Radio Oranje	9630do			
0900-1000	Singapore, SBC Radio One	5010do	5052do	11940do	
0900-0930	Switzerland, Swiss R Intl	9885au	13685au	17670au	21820au
0900-0930	United Kingdom, BBC London	6190af	6195as	9410eu	9660eu
		9740va	9750eu	9760eu	11750as
		11760me	11765as	11940af	12095me
		15070me	15190sa	15280af	15310as
		15360as	15400af	15420af	15575va
		17640me	17705va	17790va	17830as
		17885af	21470af	21660af	21715pa
0900-1000	USA, CSMonitor Boston MA	9455sa	9840eu	13615pa	15665pa
		17555as			
0900-1000	USA, KCBi Dallas TX	9815am			
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, WHRI Noblesville IN	7315am	7355am		
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0900-1000	USA, WWCN Nashville TN	5935am			
0905-1000 sa	Ghana, GBC Radio 1	4915do			
0905-1000 mtwhf	Ghana, GBC Radio 2	3366do	7295do		
0905-1000 sa	Ghana, GBC Radio 2	3366do			
0910-0940 smha	Mongolia, R Ulaanbaatar	11850as	12015as		
0915-0930 smtwh	Guam, KTWB Agana	15200as			
0930-1000	Netherlands, Radio	9720pa	11895pa	12065as	15470as
0930-1000	United Kingdom, BBC London	6190af	6195as	9410eu	9660eu
		9740va	9750eu	9760eu	11750as
		11760me	11940af	12095me	15070me
		15190sa	15310as	15400af	15420af
		15575va	17640me	17705eu	17790va
		17830va	17885af	21470af	21660af
		21715pa			
0940-0950	Greece, Voice of	17525au			

1000 UTC [6:00 AM EDT/3:00 AM PDT]

1000-1100	Australia, Radio	5995pa	6020pa	9580pa	9710pa
		13605pa	13605pa	15170as	21725as
1000-1100 vl	Australia, VL8A Alice Spg	2310do			
1000-1100 vl	Australia, VL8K Katherine	2485do			
1000-1100 vl	Australia, VL8T Tent Crk	2325do			
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	11755au	15440au	17710au	
1000-1100	Costa Rica, AWR Alajuela	9725ca			
1000-1100	Costa Rica, R forPeace Int	7375pa	7385na	13630na	15030na
1000-1100	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
1000-1100 sa	Ghana, GBC Radio 1	4915do			
1000-1100 mtwhf	Ghana, GBC Radio 2	7295do			
1000-1100 sa	Ghana, GBC Radio 2	3366do			
1000-1100	India, All India Radio	15050as	17387au	17895as	21735au
1000-1030	Israel, Kol Israel	17545eu			
1000-1100	Italy, AWR Europe	7230eu			
1000-1100 vl	Italy, IRRS Milano	7125va			
1000-1100	Kenya, Kenya BC Corp	4935do			
1000-1100 mtwh	Malaysia, RTM Radio 4	7295do			
1000-1027	Netherlands, Radio	9720pa	11895pa	12065as	15470as
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100	Nigeria, Radio	4990do	7285do		
1000-1100	Nigeria, Voice of	7255af			
1000-1100 vl	Papua New Guinea, NBC	4890do			
1000-1100	Philippines, FEBC Manila	9800as	11685as		
1000-1100	Russia, Radio Moscow Intl	11630eu	11655eu	11765af	11800na
		11940af	12010eu	12020eu	12070eu
		15125me	15140eu	15225na	15350me
		15355eu	15470eu	15490as	17595as
		17675af	17760na	17775as	17805af
		21655af			
1000-1100	S Africa, Channel Africa	17805af			
1000-1100 vl	S Africa, Radio Oranje	9630do			
1000-1030	Serbia, Radio Yugoslavia	9580eu	11805eu		
1000-1100	Singapore, SBC Radio One	5010do	5052do	11940do	
1000-1045	Switzerland, Swiss R Intl	6165eu	9535eu		
1000-1030	United Kingdom, BBC London	6190af	6195va	9410va	9660eu
		9740va	9750eu	9760eu	11750as
		11760me	11940af	12095eu	15070va
		15190am	15260sa	15310as	15400af
		15420af	15575va	17640va	17705eu
		17790va	17830pa	17885af	21470va
		21660af	21715pa		
1000-1100	USA, CSMonitor Boston MA	9455sa	9495na	13625as	17555as
1000-1100	USA, KCBi Dallas TX	9815am			
1000-1100	USA, KTBN Salt Lk City UT	7510am			
1000-1100	USA, VOA Washington DC	5985as	7405am	9590am	11720as
		11735me	11915am	15120am	15160me
		15195eu	15425as	17770eu	21455eu
1000-1100	USA, WHRI Noblesville IN	7315am			
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100	USA, WWCN Nashville TN	5835am			
1000-1100	USA, WYFR Okeechobee FL	5950am			
1000-1015 mtwhfa	Vatican State, Vatican R	6245eu	7250eu	11740eu	15210eu
		21665eu			
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1003-1006	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
1030-1100	Austria, R Austria Intl	15450au	21490au		
1030-1100	Bulgaria, Radio	13670eu	17760eu	17830eu	
1030-1057	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu
		15355eu			
1030-1100	Netherlands, Radio	12065as	15470as		
1030-1100	South Korea, Radio Korea	11715na			
1030-1100	Sri Lanka, SLBC Colombo	11835as	15120as	17850as	
1030-1100	UAE, UAE Radio Dubai	13675eu	15320eu	15435eu	21605eu
1030-1100	United Kingdom, BBC London	6190af	6195va	9410va	9660eu
		9740va	9750eu	9760eu	11750as
		11760me	11940af	12095eu	15070va
		15190am	15260sa	15310as	15400af
		15420af	15575va	17640va	17705eu
		17790va	17885af	21470va	21660af
1040-1050	Greece, Voice of	15650as	17525as		

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1100 UTC

[7:00 AM EDT/4:00 AM PDT]

FREQUENCIES

1100-1200	Australia, ABC Brisbane	4920do			
1100-1200	Australia, Radio	5995pa	6020pa	6080pa	7240pa
		9510pa	9580pa	9710pa	13605pa
		15170pa	21745pa		
1100-1200 vl	Australia, VL8A Alice Spg	2310do			
1100-1200 vl	Australia, VL8K Katherine	2485do			
1100-1200 vl	Australia, VL8T Tent Crk	2325do			
1100-1200	Bulgaria, Radio	13670eu	17760eu	17830eu	
1100-1200	Canada, CFCX Montreal	6005do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CHNX Halifax	6130do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	Costa Rica, AWR Alajuela	9722ca	11870ca		
1100-1200	Costa Rica, R for Peace Int	7385na	13630na	15030na	
1100-1130	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
1100-1150	Germany, Deutsche Welle	15370af	15410af	17715af	17765af
		17800af	17860af	21465af	21600af
1100-1200	Ghana, GBC Radio 1	4915do			
1100-1110 mtwhf	Ghana, GBC Radio 2	7295do			
1100-1200 sa	Ghana, GBC Radio 2	3366do			
1100-1200 vl	Italy, IRRS Milano	7125va			
1100-1200	Japan, NHK/Radio Japan	6120na	11910na	15240na	
1100-1200	Malaysia, RTM Radio 4	4950do	7295do		
1100-1130	Mozambique, R Mocambique	11820af	11835af		
1100-1125	Netherlands, Radio	12065as	15470as		
1100-1200	New Zealand, R NZ Intl	9700as			
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na	
1100-1120	Pakistan, Radio	17595eu	17900eu	21520eu	
1100-1200 vl	Papua New Guinea, NBC	4890pa			
1100-1200	Russia, Radio Moscow Intl	11765me	11785me	11800me	12020na
		13650na	15125as	15130as	15140me
		15225me	15290me	15320as	15355na
		15405as	15420as	15490me	15540as
		17570na	17595me	17675me	17735na
		17755na	17760na	17780me	17815as
		17875as			
1100-1200	S Africa, Channel Africa	9730af			
1100-1200 vl	S Africa, Radio Oranje	9630do			
1100-1200	Singapore, SBC Radio One	5010do	5052do	11940do	
1100-1129	Solomon Islands, SIBC	5020do	9545do		

1100-1200	South Korea, Radio Korea	6145na	9650na		
1100-1130	Sri Lanka, SLBC Colombo	11835as	15120as	17850as	
1100-1130	Switzerland, Swiss R Intl	13635as	15505as	17670as	17670as
		21820as			
1100-1200	Taiwan, Voice of Asia	7445as			
1100-1130	United Kingdom, BBC London	5965na	6190af	6195va	9410eu
		9515na	9600eu	9700au	9740va
		9750eu	9760eu	11750as	11760me
		11940af	12095eu	15070va	15220na
		15310as	15400eu	15420af	15575me
		17640va	17705eu	17790af	17885va
		21470va	21660af		
1100-1200	USA, CS Monitor Boston MA	9455sa	9495na	13625as	17555as
1100-1200	USA, KCBI Dallas TX	9815am			
1100-1200	USA, KTNB Salt Lk City UT	7510na			
1100-1200	USA, VOA Washington DC	5985as	6110as	7405am	9590am
		9760as	11720as	11915am	15120am
		15160as	15425as		
1100-1200	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200	USA, WWCR Nashville TN	5935am			
1100-1200	USA, WYFR Okeechobee FL	5950na	7355na	11830na	
1100-1130	Vietnam, Voice of	7287as	9730as		
1115-1145	Nepal, Radio	3230as	5005as	7165as	
1130-1200	Austria, R Austria Intl	6155eu	13730eu		
1130-1200 s	Belgium, R Vlaanderen	15540as	17540as		
1130-1200	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1130-1150 mtwhf	Finland, Radio	11735na	15400na		
1130-1200	Iran, VOIRI Tehran	9525me	11715me	11790me	11910as
		11930as			
1130-1200	Netherlands, Radio	5955eu	9860eu		
1130-1200	Serbia, Radio Yugoslavia	21605am			
1130-1200	Thailand, Radio	4830as	9655as	11905as	
1130-1200	United Kingdom, BBC London	5965na	6190af	6195va	9410eu
		9515na	9600eu	9740va	9750eu
		9760eu	11750as	11760me	11940af
		12095eu	15070va	15220na	15310as
		15420af	15575me	17640af	17695as
		17705eu	17790af	17885va	21470va
		21660af			

SELECTED PROGRAMS

Sundays

- 1100 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1100 WWCR: Apostolic Witness. Lonnie Wollard presents an evangelical program.
 1105 Swiss Radio Int'l: Feature. See S 0605.
 1115 WWCR: Christ The Rock Ministry. David Robert presents an evangelical program.
 1130 BBC: The Ken Bruce Show. See S 0030.
 1130 WWCR: Staff Of Life Ministry. Irene Armstrong presents an evangelical program.
 1136 Radio Vlaanderen Int'l: P Box 26. See S 0636.
 1145 WWCR: Power Of The Cross. Jerry King presents an evangelical program.
 1149 Radio Vlaanderen Int'l: Music From Flanders. See S 0649.

Mondays

- 1100 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1100 WWCR: Project Saturn Global. Catherine Kahn presents an evangelical program.
 1105 Swiss Radio Int'l: Dateline. See M 0605.
 1130 BBC: Composer Of The Month. See M 0230.
 1130 WWCR: Feature. Programs in this time slot include "Jazz

Connection," "Bread Of Life," "Reaching The World," and "The Challenge We Face."

Tuesdays

- 1100 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1100 WWCR: Project Saturn Global. See M 1100.
 1105 Swiss Radio Int'l: Dateline. See M 0605.
 1130 BBC: Megamix. Music, sports, fashion, health, travel, news, and opinion for young people.
 1130 WWCR: World Of Radio. See S 0305.

Wednesdays

- 1100 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1100 WWCR: Project Saturn Global. See M 1100.
 1105 Swiss Radio Int'l: Dateline. See M 0605.
 1130 BBC: Meridian. See W 0630.
 1130 WWCR: What A Fellowship Hour. Clay Evans presents an evangelical program.

Thursdays

- 1100 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1100 WWCR: Project Saturn Global. See M 1100.

- 1105 Swiss Radio Int'l: Dateline. See M 0605.
 1130 BBC: Drama. A half-hour production from the BBC's crack drama team.
 1130 WWCR: Afterglow. Don Johnson presents an evangelical program.

Fridays

- 1100 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1100 WWCR: Project Saturn Global. See M 1100.
 1105 Swiss Radio Int'l: Dateline. See M 0605.
 1130 BBC: Meridian. See W 0630.
 1130 WWCR: Battle Cry Sounding. Deborah Green presents an evangelical program.

Saturdays

- 1100 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1105 Swiss Radio Int'l: Grapevine. See S 0005.
 1118 Swiss Radio Int'l: Swiss SW Merry-Go-Round. See S 0018.
 1130 BBC: Meridian. See W 0630.
 1130 WWCR: Words Of Hope. See S 1230.
 1145 WWCR: Focus On The Family. See M 1302.

1200 UTC

[8:00 AM EDT/5:00 AM PDT]

FREQUENCIES

1200-1300	Australia, AAF Radio	12070as			
1200-1300	Australia, ABC Brisbane	4920do			
1200-1300	Australia, ABC Perth	6140do	9610do		
1200-1230	Australia, Radio	5995pa	6020pa	6080pa	7240pa
		9580pa	9710pa	21745as	
1200-1300 vl	Australia, VL8A Alice Spg	2310do			
1200-1300 vl	Australia, VL8K Katherine	2485do			
1200-1300 vl	Australia, VL8T Tent Crk	2325do			
1200-1300	Brazil, Radiobras	15445am			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFPV Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1259 mtwhf	Canada, RCI Montreal	9635na	11855na	17820na	
1200-1300	China, China Radio Intl	8425pa	9715as	11660as	11795pa
		15210na	15440pa	15450pa	
1200-1300	Costa Rica, AWR Alajuela	9725ca	11870ca		
1200-1300	Costa Rica, R for Peace Int	7385am	15030na	21465am	
1200-1300	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455om			
1200-1300	Ghana, GBC Radio 1	4915do			
1200-1225 sa	Ghana, GBC Radio 2	3366do			
1200-1230	Iran, VOIRI Tehran	9525me	11715me	11790me	11910as
		11930as			
1200-1300 vl	Italy, IRRS Milano	7125eu			
1200-1300	Kenya, Kenya BC Corp	4935do			
1200-1300	Malaysia, RTM Radio 4	7295do			
1200-1230 smwha	Mongolia, R Ulaanbaatar	11850as	12015as		
1200-1206	New Zealand, R NZ Intl	9700as			
1200-1300	Nigeria, Radio	4990do	7285do		
1200-1300	Nigeria, Voice of	7255af			
1200-1230 m	Norway, Radio Norway Intl	17730as	17860as		
1200-1300	Palau, KHBN Voice of Hope	9830as			
1200-1300 vl	Papua New Guinea, NBC	4890do			
1200-1255	Poland, Polish R Warsaw	6135eu	7145eu	9525eu	11815eu
1200-1300	Russia, AWR Russia	11835eu			
1200-1300	Russia, Radio Moscow Intl	11765af	11785af	11800me	15140as
		15155as	15170me	15220am	15225as
		15280na	15290as	15320me	15355as
		15440me	15480as	15490na	15540na
		15550me	17590na	17595na	17645na
		17670na	17675af	17735me	17760na
		17765me	17790na	17815me	

1200-1300 vl	S Africa, Radio Oranje	9630do			
1200-1300	Singapore, SBC Radio One	5010do	5052do	11940do	
1200-1300	South Korea, Radio Korea	9640na			
1200-1230	Thailand, Radio	9655as	11905as		
1200-1230	United Kingdom, BBC London	6190af	6195na	9410eu	9515na
		9660eu	9740as	9750eu	9760eu
		11750as	11760me	11940af	12095eu
		15070va	15220na	15260sa	15310as
		15575va	17640af	17705eu	17790af
		17885af	21470af	21660af	
1200-1215	United Kingdom, BBC London	7160as	9605as	11920as	
1200-1300	USA, CS Monitor Boston MA	9425pa	9495na	13625as	13760sa
1200-1300 as	USA, CS Monitor Boston MA	15665eu			
1200-1300	USA, KCBI Dallas TX	9815am			
1200-1300	USA, KTNB Salt Lk City UT	7510am			
1200-1300	USA, VOA Washington DC	6110as	9760as	11715as	15160as
		15425as			
1200-1300	USA, WEWN Birmingham AL	9350am	15695am		
1200-1300	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
1200-1300	USA, WJCR Upton KY	7490na	13595na		
1200-1300	USA, WWCR Nashville TN	13845am	15685am		
1200-1300	USA, WYFR Okeechobee FL	5950am	6015am	11830am	17750am
1200-1225	Uzbekistan, R Tashkent	7285as	9715as	15295as	17815as
1207-1300 ocasnal	New Zealand, R NZ Intl	9510as			
1215-1300	Egypt, Radio Cairo	17595as			
1226-1300	Ghana, GBC Radio 2	7295do			
1230-1300	Australia, Radio	5995pa	6020pa	7150pa	7240pa
		9580pa	9770pa	13755pa	21745pa
1230-1300	Bangladesh, Radio	11708eu	13610eu	13620eu	15200eu
1230-1259	Canada, RCI Montreal	9660as	15195as		
1230-1300	Finland, Radio	11900na	15400na		
1230-1255	France, Radio France Intl	9805eu	11670eu	15155eu	15195eu
		15365na	17575na	17575eu	
1230-1300	Netherlands, Radio	5955eu	9860eu		
1230-1300	Sri Lanka, SLBC Colombo	6075as	9720as		
1230-1300	Sweden, Radio	15240pa	21500as		
1230-1300	Turkey, Voice of	9675as			
1230-1300	United Kingdom, BBC London	6190af	6195na	9410eu	9515na
		9660eu	9740as	9750eu	9760eu
		11750as	11760me	11940af	12095eu
		15070va	15220na	15260sa	15310as
		15575va	17640af	17705eu	17790af
		17885af	21470af	21660af	
1230-1300	Vietnam, Voice of	9840as	12020as	15010as	

SELECTED PROGRAMS

Sundays

- 1200 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1200 WWCR: Gospel Crusade Ministry. Roger Hedrick presents an evangelical program.
 1201 BBC: Play Of The Week. See S 0101.
 1230 WWCR: Words Of Hope. Eugene Brown presents an evangelical program.
 1245 WWCR: Weekly Presidential Radio Address. President Clinton speaks to the nation.

Mondays

- 1200 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1200 WWCR: End-Time Revival Network. An evangelical program.
 1209 BBC: Words Of Faith. Speakers from various faiths discuss scripture and their beliefs.
 1215 BBC: Quiz. Robert Robinson continues the quest to find the "Brain Of Britain" (through September 6th).
 1230 WWCR: World Of Radio. See S 0305.
 1245 BBC: Sports Roundup. See S 0315.

Tuesdays

- 1200 WWCR (Program 2): Univ Network Cathedral. See S 0000.

- 1200 WWCR: End-Time Revival Network. See M 1200.
 1209 BBC: Words Of Faith. See M 1209.
 1215 BBC: Multitrack 1. See M 2330.
 1230 WWCR: We Believe. Jim Walsh presents an evangelical program.
 1245 BBC: Sports Roundup. See S 0315.

Wednesdays

- 1200 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1200 WWCR: End-Time Revival Network. See M 1200.
 1209 BBC: Words Of Faith. See M 1209.
 1215 BBC: New Ideas. See M 1615.
 1230 WWCR: Radio Techniques. A program from Howard Weinstein.
 1235 BBC: Talks. See M 1635.
 1245 BBC: Sports Roundup. See S 0315.

Thursdays

- 1200 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1200 WWCR: End-Time Revival Network. See M 1200.
 1209 BBC: Words Of Faith. See M 1209.
 1215 BBC: Multitrack 2. See W 2330.
 1230 WWCR: Unshackled. The ever-present evangelical melo

- drama about changed lives.
 1245 BBC: Sports Roundup. See S 0315.

Fridays

- 1200 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1200 WWCR: End-Time Revival Network. See M 1200.
 1209 BBC: Words Of Faith. See M 1209.
 1215 BBC: Feature. Wanda Petrusiewicz travels in search of "The Slavs" (6th, 13th).
 1230 WWCR: Afterglow. See H 1130.
 1245 BBC: Sports Roundup. See S 0315.

Saturdays

- 1200 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1200 WWCR: Focus On The Family. See M 1302.
 1209 BBC: Words Of Faith. See M 1209.
 1215 BBC: Multitrack 3. See F 2330.
 1215 WWCR: Bible Lovers' Fellowship. J.R. Boyd presents an evangelical program.
 1230 WWCR: Prophecy Flash. William Dankenbring presents an evangelical program.
 1245 BBC: Sports Roundup. See S 0315.

1300 UTC

[9:00 AM EDT/6:00 AM PDT]

FREQUENCIES

1300-1400	Australia, ABC Brisbane	4920do			
1300-1400	Australia, ABC Perth	9610do			
1300-1400	Australia, Radio	5995pa	7240pa	9580pa	11800pa
		11855as	13755as		
1300-1330 mtwtf	Belgium, R Vlaanderen	15540na	17540as		
1300-1320	Brazil, Radiobras	15445am			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400 mtwhf	Canada, RCI Montreal	9635na	11855na	17820am	
1300-1400 s	Canada, RCI Montreal	11955na	17820na		
1300-1400	China, China Radio Intl	9405as	9715as	11660pa	11855as
1300-1400	Costa Rica, R for Peace Int	7385am	15030na	21465am	
1300-1400	Ecuador, HCBJ Quito	11925am	15115am	17490am	17890am
		21455am			
1300-1330	Egypt, Radio Cairo	17595as			
1300-1400 as	Finland, Radio	15400na	21550na		
1300-1325	Israel, Kol Israel	11587na	11603na	15640na	15650as
		17575eu	17590eu		
1300-1400 vl	Italy, IRRS Milano	7125va			
1300-1330	Kazakhstan, R Alma Ata	7255as			
1300-1325	Kenya, Kenya BC Corp	4935do			
1300-1400	Lebanon, Wings of Hope	11530me			
1300-1400	Malaysia, RTM Radio 4	7295do			
1300-1400	Nigeria, Radio	4990do	7285do		
1300-1400	Nigeria, Voice of	7255af			
1300-1350	North Korea, R Pyongyang	9345eu	9640as	11740as	15230as
1300-1330 m	Norway, Radio Norway Intl	9590eu	15230eu		
1300-1400	Palau, KHBN Voice of Hope	9830as			
1300-1400	Philippines, FEBC Manila	11995as			
1300-1400	Romania, R Romania Intl	11940eu	15365eu	17720eu	17850eu
1300-1400	Russia, Radio Moscow Intl	9640na	9755na	9885na	9895na
		11940eu	11995na	15140me	15225na
		15280as	15290na	15320as	15355me
		15480as	15550as	17595as	17735me
		17760na	17790na	17860me	21610as
		21625me	21785me		
1300-1400 vl	S Africa, Radio Oranje	9630do			
1300-1400	Singapore, SBC Radio One	5010do	5052do	11940do	
1300-1330	South Korea, Radio Korea	9750as	13670as		
1300-1400	Sri Lanka, SLBC Colombo	6075as	9720as		

1300-1330	Switzerland, Swiss R Intl	7480as	11690as	13635as	15505as
		17670as	21820as		
1300-1330	United Kingdom, BBC London	6190af	6195va	7180pa	9410eu
		9515na	9660eu	9740am	9750eu
		9760eu	11750as	11760me	11820am
		11940af	12095eu	15070am	15105af
		15220am	15250as	15310as	15420af
		15575me	17640af	17705eu	17790af
		17885af	21470af	21660af	
1300-1400	USA, CS Monitor Boston MA	9425pa	9495na	13625as	13760sa
1300-1400 as	USA, CS Monitor Boston MA	15665eu			
1300-1400	USA, KNLS Anchor Point AK	7355as			
1300-1400	USA, KLTN Salt Lk City UT	7510am			
1300-1400	USA, VOA Washington DC	6110as	9760as	11715as	15160as
		15425as			
1300-1400	USA, WEWN Birmingham AL	9350na			
1300-1400	USA, WHRI Noblesville IN	9465na	11790na		
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400	USA, WWCN Nashville TN	13845am	15685am		
1300-1400	USA, WYFR Okeechobee FL	5950na	6015na	11830na	13695na
		17750na			
1302-1400	Taiwan, VO Free China	11550as			
1320-1400	Jordan, Radio	9560eu			
1325-1400 mtwhf	Kenya, Kenya BC Corp	4935do			
1330-1400	Austria, R Austria Intl	15450as			
1330-1359	Canada, RCI Montreal	9535as	11795as	11935eu	15315eu
		15325eu	17820eu	17895af	21455eu
		21710eu			
1330-1400 mtwhf	Finland, Radio	11900na	15400na	21550na	
1330-1400	India, All India Radio	11760as	15120as		
1330-1400	Laos, National Radio of	7116as			
1330-1400	Netherlands, Radio	9890as	13700as	15150as	17610as
1330-1400	UAE, UAE Radio Dubai	13675eu	15320eu	15435as	21605as
1330-1400	United Kingdom, BBC London	6190af	6195va	7180pa	9410eu
		9515na	9660eu	9740va	9750eu
		9760eu	11750as	11760me	11820va
		11940af	12095eu	15070va	15220am
		15250as	15310as	15420af	15575me
		17640va	17705eu	17790va	17885af
		21470va	21660af		
1330-1400	Uzbekistan, R Tashkent	7285as	9715as	15295as	17815as
1330-1400	Vietnam, Voice of	9840as	15009as		
1335-1345	Greece, Voice of	15630na	17515am		
1345-1400	Vatican State, Vatican R	15090as	17525as		

SELECTED PROGRAMS

Sundays

- 1300 KNLS: Feature. Topical programming on various subjects, including music, listener letters, and religion.
 1300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1300 WWCR: Wings Of Healing. Evelyn Wyatt presents an evangelical program.
 1305 Swiss Radio Intl: Feature. See S 0605.
 1330 WWCR: Wayne Avenue Church Of God. J.C. Wilber presents an evangelical program.

Mondays

- 1300 KNLS: Feature. See S 1300.
 1300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1302 WWCR: Focus On The Family. James Dobson presents an evangelical program.
 1304 Radio Vlaanderen Intl: Press Review. See M 0634.
 1305 Swiss Radio Intl: Dateline. See M 0605.
 1307 Radio Vlaanderen Intl: Radio World. See M 0637.
 1317 Radio Vlaanderen Intl: Tourism In Flanders. See M 0647.
 1330 WWCR: Oasis. Carl Richardson presents an evangelical program.
 1335 WWCR: The Bright Spot Hour. Harold Sightler presents an evangelical program.

Tuesdays

- 1300 KNLS: Feature. See S 1300.
 1300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1302 WWCR: Focus On The Family. See M 1302.

- 1304 Radio Vlaanderen Intl: Press Review. See M 0634.
 1305 Swiss Radio Intl: Dateline. See M 0605.
 1307 Radio Vlaanderen Intl: Belgium Today. See M 2337.
 1312 Radio Vlaanderen Intl: Focus On Europe. See M 2342.
 1317 Radio Vlaanderen Intl: Sports. See M 2347.
 1330 WWCR: Oasis. See M 1330.
 1335 WWCR: The Bright Spot Hour. See M 1335.

Wednesdays

- 1300 KNLS: Feature. See S 1300.
 1300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1302 WWCR: Focus On The Family. See M 1302.
 1304 Radio Vlaanderen Intl: Press Review. See M 0634.
 1305 Swiss Radio Intl: Dateline. See M 0605.
 1307 Radio Vlaanderen Intl: Belgium Today. See M 2337.
 1312 Radio Vlaanderen Intl: Around The Arts. See T 2342.
 1317 Radio Vlaanderen Intl: P Box 26. See S 0636.
 1330 WWCR: Oasis. See M 1330.
 1335 WWCR: The Bright Spot Hour. See M 1335.

Thursdays

- 1300 KNLS: Feature. See S 1300.
 1300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1302 WWCR: Focus On The Family. See M 1302.
 1304 Radio Vlaanderen Intl: Press Review. See M 0634.
 1305 Swiss Radio Intl: Dateline. See M 0605.
 1307 Radio Vlaanderen Intl: Belgium Today. See M 2337.
 1312 Radio Vlaanderen Intl: Living In Belgium. See W 2342.

- 1317 Radio Vlaanderen Intl: Green Society. See W 2347.
 1330 WWCR: Oasis. See M 1330.
 1335 WWCR: The Bright Spot Hour. See M 1335.

Fridays

- 1300 KNLS: Feature. See S 1300.
 1300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1302 WWCR: Focus On The Family. See M 1302.
 1304 Radio Vlaanderen Intl: Press Review. See M 0634.
 1305 Swiss Radio Intl: Dateline. See M 0605.
 1307 Radio Vlaanderen Intl: Belgium Today. See M 2337.
 1312 Radio Vlaanderen Intl: Economics. See H 2342.
 1320 Radio Vlaanderen Intl: North-South. See H 2350.
 1330 WWCR: Oasis. See M 1330.
 1335 WWCR: The Bright Spot Hour. See M 1335.

Saturdays

- 1300 KNLS: Feature. See S 1300.
 1300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1300 WWCR: Church Of The Lord Jesus Christ. A.W. McKenzie presents an evangelical program.
 1304 Radio Vlaanderen Intl: Press Review. See M 0634.
 1305 Swiss Radio Intl: Grapevine. See S 0005.
 1307 Radio Vlaanderen Intl: Radio World. See M 0637.
 1317 Radio Vlaanderen Intl: Tourism In Flanders. See M 0647.
 1318 Swiss Radio Intl: Swiss SW Merry-Go-Round. See S 0018.
 1330 WWCR: Hour Of Reasoning. P. Mobley presents an evangelical program.

1400 UTC

[10:00 AM EDT/7:00 AM PDT]

FREQUENCIES

1400-1450	Australia, AAF Radio	13508af			
1400-1500	Australia, ABC Brisbane	4920do			
1400-1500	Australia, ABC Perth	6140do			
1400-1500	Australia, Radio	5995pa	6060pa	7240pa	7260as
		9510as	9580pa	9770as	11800pa
		11855as	13755as		
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500 s	Canada, RCI Montreal	11955na	17820na		
1400-1500 mtwhfa	Canada, RCI Montreal	11935eu	15315eu	15325eu	17820eu
		17895eu	21455eu	21710eu	
1400-1500	China, China Radio Intl	4200as	7405as	11815na	11855as
		15165as			
1400-1500	Costa Rica, R for Peace Int	7385am	15030am		
1400-1430	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455am			
1400-1500	France, Radio France Intl	11910as	17650me	17695eu	
1400-1500	Ghana, GBC Radio 1	4915do			
1400-1500	Ghana, GBC Radio 2	7295do			
1400-1500	India, All India Radio	11760as	15120as		
1400-1500 vl	Iraq, Radio Iraq Intl	15250as			
1400-1500 vl	Italy, IRRS Milano	7125va			
1400-1500	Japan, NHK/Radio Japan	9535am	9750	11735as	11815as
		11865am			
1400-1500	Jordan, Radio	9560eu			
1400-1500 mtwhf	Kenya, Kenya BC Corp	4935do			
1400-1500	Lebanon, King of Hope	6280me			
1400-1500	Malaysia, RTM Radio 4	4950do	7295do		
1400-1500	Malta, V of Mediterranean	11925eu			
1400-1500	Netherlands, Radio	9890as	13770as	15150as	17610as
1400-1500	Nigeria, Voice of	7255af			
1400-1500	Palau, KBN Voice of Hope	9830as			
1400-1500	Philippines, FEBC Manila	11995as			
1400-1500	Russia, Radio Moscow Intl	9640na	9755na	9825na	9895na
		11665me	11705as	11870as	11940as
		11995na	15125af	15140as	15225na
		15290na	15320af	15355as	15480as
		17580af	17595af	17595af	17760na
		17790na	21785as		
1400-1500 vl	S Africa, Radio Oranje	9630do			
1400-1430	Serbia, Radio Yugoslavia	9505eu			
1400-1500	Singapore, SBC Radio One	5010do	5052do	11940do	
1400-1500	South Korea, Radio Korea	5975as	6135as		
1400-1500	Sri Lanka, SLBC Colombo	6075as	9720as		
1400-1500	Taiwan, VO Free China	11550as			
1400-1430	United Kingdom, BBC London	6195as	7180as	9410eu	9515na
		9660eu	9740as	9750eu	9760eu
		11750as	11820as	11940af	12095eu
		15070va	15250as	15260af	15310as
		15575me	17640va	17705eu	17790af
		17840am	17880af	21490va	21660af
		19530as	13625as	13760am	15665eu
1400-1500	USA, CSMonitor Boston MA	13710na			
1400-1500 sa	USA, CSMonitor Boston MA	13710na			
1400-1500	USA, KCBI Dallas TX	15375va			
1400-1500	USA, KJES Mesquite NM	11715na			
1400-1500	USA, KTNB Salt Lk City UT	7510na			
1400-1500	USA, VOA Washington DC	6110as	7125as	9645as	9760as
		15160as	15255as	15395as	15425as
1400-1500	USA, WEWN Birmingham AL	9350na			
1400-1500	USA, WHRI Noblesville IN	9465na	15105na		
1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500	USA, WWCR Nashville TN	13845am	15685am		
1400-1500	USA, WYFR Okeechobee FL	6015am	11550as	11830am	17750na
1400-1405	Vatican State, Vatican R	15090au	17525au		
1415-1500	Bhutan, BC Service	5025do			
1415-1425	Nepal, Radio	3230do	5005do	7165do	
1430-1500	Afghanistan, Radio	7200as			
1430-1500	Albania, R Tirana Intl	7155eu	9760eu		
1430-1500	Austria, R Austria Intl	6155eu	13730eu	15450eu	21490va
1430-1500	Ecuador, HCJB Quito	11925am	17490va	17890am	21455am
1430-1500 m	Indonesia, RRI Padang	4003pa			
1430-1500	Myanmar, VO Myanmar	5990do			
1430-1500 mtwhf	Portugal, Radio	21515me			
1430-1500	Romania, R Romania Intl	11775as	15335as	17720as	
1430-1500	United Kingdom, BBC London	6190af	6195as	7180as	9410eu
		9515na	9660eu	9740as	9750eu
		9760eu	11750as	11820as	11860me
		11940af	12095eu	15070eu	15250as
		15260me	15310as	15575me	17640va
		17705eu	17790af	17840am	17880af
		21470va	21660af		
1445-1500 smha	Mongolia, R Ulaanbaatar	7560as	7780as		

SELECTED PROGRAMS

Sundays

- 1400 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1400 WWCR: Foursquare Gospel Tidings. J.E. Cartier presents an evangelical program.
 1401 BBC: Feature. Changes in Catholicism are the subject of "The Pope's Divisions" (1st); (8th, 15th) Images of Women, Images of Men; history of portrait painting; (22nd, 29th) The Fight Against Aids.
 1430 BBC: Anything Goes. Bob Holness presents a variety of musical requests.
 1430 WWCR: A Temple Of Jesus Christ. Cleveland Waters presents an evangelical program.

Mondays

- 1400 BBC (as): Dateline East Asia. The political and economic affairs of the Pacific rim.
 1400 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1402 WWCR: The Grace Hour. Carl Stevens presents a live evangelical program.
 1405 BBC: Outlook. Conversation, controversy, and color from the UK and the world.
 1430 BBC: Off The Shelf. See M 0430.
 1445 BBC: Musical Feature. See S 0445.

Tuesdays

- 1400 BBC (as): Dateline East Asia. See M 1400.
 1400 WWCR (Program 2): Univ Network Cathedral. See S 0000.

- 1402 WWCR: The Grace Hour. See M 1402.

- 1405 BBC: Outlook. See M 1405.

- 1430 BBC: Off The Shelf. See M 0430.

- 1445 BBC: Musical Feature. See M 0145.

Wednesdays

- 1400 BBC (as): Dateline East Asia. See M 1400.
 1400 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1402 WWCR: The Grace Hour. See M 1402.
 1405 BBC: Outlook. See M 1405.
 1430 BBC: Off The Shelf. See M 0430.
 1445 BBC: Good Books. A personal selection of good books to read.

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Thursdays

- 1400 BBC (as): Dateline East Asia. See M 1400.
 1400 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1402 WWCR: The Grace Hour. See M 1402.
 1405 BBC: Outlook. See M 1405.
 1430 BBC: Off The Shelf. See M 0430.
 1445 BBC: Recording Of The Week. See M 0615.

Fridays

- 1400 BBC (as): Dateline East Asia. See M 1400.
 1400 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1402 WWCR: The Grace Hour. See M 1402.
 1405 BBC: Outlook. See M 1405.
 1430 BBC: Off The Shelf. See M 0430.
 1445 BBC: Global Concerns. See F 0145.

Saturdays

- 1400 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1400 WWCR: First-Hand. Rick Livingood presents an evangelical program.
 1401 BBC: Sportsworld. Extensive coverage and results from all the weekend's sports.
 1415 WWCR: God's Rescue Station. Anna Wilcox presents an evangelical program.
 1430 WWCR: The Gospel Standard. David Clark presents an evangelical program.
 1445 WWCR: In The Holy Land. See S 2345.

[11:00 AM EDT/8:00 AM PDT]

1500-1600	Australia, ABC Brisbane	6140do			
1500-1530	Australia, Radio	5995pa	6060pa	7260as	9510as
		9580pa	9770as	11800pa	11855as
		13755as			
1500-1600	Canada, CFCX Montreal	6005do			
1500-1600	Canada, CFRX Toronto	6070do			
1500-1600	Canada, CFVP Calgary	6030do			
1500-1600	Canada, CHNX Halifax	6130do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1559 s	Canada, RCI Montreal	11955na	17820na		
1500-1600	China, China Radio Intl	4200as	11815as	15165as	
1500-1600	Costa Rica, R forPeace Int	7385am	15030am		
1500-1527	Czech Republic, R Prague	6055eu	7345eu	13600me	15535af
		15605af	17535eu		
1500-1600	Ecuador, HCJB Quito	11925am	17490va	17890am	21455am
1500-1550	Germany, Deutsche Welle	7185af	9735af	11965af	13610af
		17735af	21600as		
1500-1600	Guam, KTWB Agana	15610as			
1500-1600 vl	Iraq, Radio Iraq Intl	15250as			
1500-1600 vl	Italy, IRRS Milano	7125va			
1500-1600	Japan, NHK/Radio Japan	9750as	11815as	11865na	15355af
1500-1600	Jordan, Radio	9560eu			
1500-1600	Malaysia, RTM Radio 4	4950do	7295do		
1500-1600	Malta, V of Mediterranean	11925eu			
1500-1600 smha	Mongolia, R Ulaanbaatar	7570as	7780as		
1500-1600	Myanmar, VO Myanmar	5990do			
1500-1600	Netherlands, Radio	9890as	13770as	15150as	17610as
1500-1600	Nigeria, Radio	4990do	7285do		
1500-1600	Nigeria, Voice of	7255af			
1500-1600	North Korea, R Pyongyang	9325eu	9640af	9977af	13785eu
1500-1530	Palau, KHBN Voice of Hope	9830as			
1500-1600	Philippines, FEBC Manila	11995as			
1500-1555	Poland, Polish R Warsaw	7285eu	9525eu	11840eu	
1500-1530	Romania, R Romania Intl	11775as	15335as	17720as	
1500-1600	Russia, Radio Moscow Intl	9505na	9755na	9825na	9890na
		9895na	11665me	11995na	12030na
		15125na	15170me	15180na	15290na
		15355as	15425na	15480na	15550na
		17580me	17735me	17760na	17765na

1500-1600 vl	S Africa, Radio Oranje	9630do			
1500-1555 s	Seychelles, FEBA Radio	11710as			
1500-1600	Seychelles, FEBA Radio	9810af	15330af		
1500-1600	Singapore, SBC Radio One	5010do	5052do	11940do	
1500-1600	Sri Lanka, SLBC Colombo	6075as	9720as		
1500-1530	Sweden, Radio	15190na	15240na	21500na	
1500-1530	Switzerland, Swiss R Intl	15240af	15270af	15505af	21500af
		21820me			
1500-1530	United Kingdom,BBC London	6190af	6195eu	7180as	9410eu
		9515na	9740va	9760eu	11750as
		11940af	12095eu	15070va	15250as
		15260na	15310as	15400eu	17705eu
		17840au	17860af	17880af	21470af
		21660af			
1500-1600	USA, CSMonitor Boston MA	9530as	13625as	13760am	15665eu
1500-1600	USA, KCBi Dallas TX	15375am			
1500-1600	USA, KTVN Salt Lk City UT	15590na			
1500-1600	USA, VOA Washington DC	6110as	7125as	9645as	9700as
		9760as	15205eu	15255as	15395as
		19379eu			
1500-1600	USA, WEWN Birmingham AL	17510am			
1500-1600	USA, WHRI Noblesville IN	9465sa	15105na		
1500-1600	USA, WJCR Upton KY	7490na	13595na		
1500-1600	USA, WRNO New Orleans LA		15420na		
1500-1600	USA, WWCN Nashville TN	13845am	15685am		
1500-1600	USA, WYFR Okeechobee FL	6015na	11705na	11830na	17750na
1520-1530 mtwtf	Estonia, Radio	5925eu			
1530-1600	Australia, Radio	6060pa	7260as	9510as	9560pa
		9580pa	11800pa	11855as	13755as
1530-1600	Austria, R Austria Intl	11780as			
1530-1545	Finland, Radio	6120eu	11755eu	11820eu	15240me
		21550af			
1530-1540 mtwhfa	Greece, Voice of	15630na	15650na	17525na	
1530-1600	Kazakhstan, R Alma Ata	7255as			
1530-1600	United Kingdom,BBC London	6190af	6195eu	7180as	9410eu
		9515na	9740va	9760eu	11750as
		11940af	12095eu	15070va	15260na
		15310as	15400eu	17705eu	17840am
		17860af	17880af	21470af	21660af
1545-1600	Vatican State, Vatican R	15090au	17865as		

1500 BBC (af): Postmark Africa. See S 0335.
1500 WWCR (Program 2): Univ Network Cathedral. See S 0000.
1500 WWCR: Prophetic Word Program. An evangelical program from the House of Yahweh.
1505 Swiss Radio Int'l: Feature. See S 0605.
1515 BBC: Sunday Sportsworld. Extensive coverage and results of all the weekend's sports.
1530 WWCR: Israel Magazine. A program from Israel Broadcasting.

1500 WWCR (Program 2): Univ Network Cathedral. See S 0000.
1500 WWCR: Spiritual Warfare. Mickey Bonner presents an evangelical program.
1505 Swiss Radio Int'l: Dateline. See M 0605.
1505 WWCR: Joni And Friends. Joni Erickson-Tada presents help and advice, especially for the disabled.
1510 MBC. Blantyre: Commentary. Opinion on the latest current events developments.
1510 WWCR: Life Issues. John Wilke presents an evangelical program.
1515 BBC (af): Focus On Africa. African politics, sports, economics, medicine, and media.
1515 BBC: Feature. See M 0101.
1515 WWCR: Living Waters. Robert Guste presents an evangelical program.
1530 WWCR: Time Of Deliverance. Benjamin Smith presents an evangelical program.
1545 WWCR: Revival Today. James Planck presents an evangelical program.

1500 WWCR (Program 2): Univ Network Cathedral. See S 0000.
1500 WWCR: Spiritual Warfare. See M 1500.
1505 Swiss Radio Int'l: Dateline. See M 0605.
1505 WWCR: Joni And Friends. See M 1505.
1510 WWCR: Life Issues. See M 1510.
1515 BBC (af): Focus On Africa. See M 1515.
1515 BBC: A Jolly Good Show. Dave Lee Travis presents listener
rock music requests.
1515 WWCR: Living Waters. See M 1515.
1530 WWCR: Time Of Deliverance. See M 1530.
1545 WWCR: Revival Today. See M 1545.

1500 WWCR (Program 2): Univ Network Cathedral. See S 0000.
1500 WWCR: Spiritual Warfare. See M 1500.
1505 Swiss Radio Int'l: Dateline. See M 0605.
1505 WWCR: Joni And Friends. See M 1505.
1510 WWCR: Life Issues. See M 1510.
1515 BBC (af): Focus On Africa. See M 1515.
1515 BBC: Talks. See M 0415.
1515 WWCR: Living Waters. See M 1515.
1530 BBC: Comedy. "After Henry."
1530 WWCR: Time Of Deliverance. See M 1530.
1545 WWCR: Revival Today. See M 1545.

1500 WWCR (Program 2): Univ Network Cathedral. See S 0000.
1500 WWCR: Spiritual Warfare. See M 1500.
1505 Swiss Radio Int'l: Dateline. See M 0605.
1505 WWCR: Joni And Friends. See M 1505.
1510 WWCR: Life Issues. See M 1510.

1500 WWCR (Program 2): Univ Network Cathedral. See S 0000.
1500 WWCR: Spiritual Warfare. See M 1500.
1505 Swiss Radio Int'l: Dateline. See M 0605.
1505 WWCR: Joni And Friends. See M 1505.
1510 MBC, Blantyre: Commentary. See M 1510.
1510 WWCR: Life Issues. See M 1510.
1515 BBC (af): Focus On Africa. See M 1515.
1515 BBC: Music Review. See H 2315.
1515 WWCR: Living Waters. See M 1515.
1530 WWCR: Time Of Deliverance. See M 1530.
1545 WWCR: Revival Today. See M 1545.

1500 BBC (af): Spice Taxi. See A 0630.
1500 WWCN (Program 2): Univ Network Cathedral. See S 0000.
1500 WWCN: Bill Rudge Ministries. Bill Rudge presents an evangelical program.
1505 Swiss Radio Int'l: Grapevine. See S 0005.
1515 BBC: SportsWorld. See A 1401.
1515 WWCN: Eternal Good News. Germaine Lockwood presents an evangelical program.
1518 Swiss Radio Int'l: Swiss SW Merry-Go-Round. See S 0018.
1530 WWCN: New Testament Scriptures. Alexander Scourby presents an evangelical program.
1545 WWCN: World Missions Broadcast. Dan Smith presents an evangelical program.

1600 UTC

[12:00 PM EDT/9:00 AM PDT]

FREQUENCIES

1600-1700	Algeria, Radio Algiers	11715af	15160af			1600-1700	Swaziland, Trans World R	9500af			
1600-1630	Australia, Radio	6060pa	7240pa	7260pa	9560pa	1600-1645	UAE, UAE Radio Dubai	11795af	13675eu	15435eu	21605eu
		9580pa	11800pa	11855pa	11880pa	1600-1630	United Kingdom, BBC London	3915as	6190af	6195eu	9410eu
		13755pa						9515na	9740va	11750as	12095va
1600-1700	Canada, CFCX Montreal	6005do						15070va	15260na	15310as	15400eu
1600-1700	Canada, CFRX Toronto	6070do						17840af	17860af	17880af	21470af
1600-1700	Canada, CFPV Calgary	6030do						21660af			
1600-1700	Canada, CHNX Halifax	6130do				1600-1700	USA, CS Monitor Boston MA	11580as	13625va	17510na	21640af
1600-1700	Canada, CKZU Vancouver	6160do				1600-1700 sa	USA, CS Monitor Boston MA	13710na	17555am		
1600-1700	China, China Radio Intl	11575af	15110af	15130af		1600-1700	USA, KCBI Dallas TX	15375va			
1600-1700	Costa Rica, R for Peace Int	7375na	7385am	13630na	15030na	1600-1700	USA, KTNB Salt Lk City UT	15590am			
1600-1700	Ecuador, HCJB Quito	17790me	21455am	21480me		1600-1700	USA, VOA Washington DC	6110as	7125as	9645as	9700as
1600-1700	France, Radio France Intl	6175eu	11705af	12015af	15530me			9760as	11920af	11995af	13710af
		17620af	17795af	17850af				15255as	15255af	15395as	15445af
1600-1630	Georgia, Georgian Radio	9656eu						17895af			
1600-1650	Germany, Deutsche Welle	6170as	7225as	9875as	11785as	1600-1630	USA, VOA Washington DC	9700eu	15205eu	15255eu	19379eu
		15105as	15595as	17810as	21680as	1600-1700	USA, WEWN Birmingham AL	11753na			
1600-1700	Ghana, GBC Radio 1	4915do				1600-1700	USA, WHRI Noblesville IN	9465na	13760na	15105na	
1600-1700	Ghana, GBC Radio 2	7295do				1600-1700	USA, WJCR Upton KY	7490na	13595na		
1600-1700	Guam, KSDA Agana	11980as				1600-1700	USA, WRNO New Orleans LA	15420na			
1600-1645	Guam, KTRW Agana	15610as				1600-1700	USA, WWCR Nashville TN	13845am	15685am		
1600-1700 vl	Iraq, Radio Iraq Intl	15250as				1600-1700	USA, WYFR Okeechobee FL	11705na	11830af	15355eu	17750eu
1600-1630	Italy, AWR Europe	15125eu						21525af	21615af		
1600-1700 vl	Italy, IRRS Milano	7125va				1600-1630	Vatican State, Vatican R	6245eu	7250eu	15090as	17865as
1600-1615 mha	Mongolia, R Ulaanbaatar	7560as	7780as			1600-1630 a	Vatican State, Vatican R	15090af	17730af		
1600-1630	Netherlands, Radio	9890as	13700as	15150as	17610as	1600-1630	Vietnam, Voice of	9840af	12020af	15010af	
1600-1700	Nigeria, Radio	4990do				1620-1700 vl	S Africa, Radio Oranje	3230do			
1600-1700	Nigeria, Voice of	7255af				1630-1700	Australia, Radio	5995pa	6060pa	7240pa	7260pa
1600-1630 s	Norway, Radio Norway Intl	15230eu	17720me					9510pa	9580pa	11695pa	13755pa
1600-1630	Pakistan, Radio	11570me	13685af	15555af	17558af	1630-1657	Canada, RCI Montreal	7150as	9555as		
		21495af				1630-1700	Ecuador, HCJB Quito	17790me	21455me		
1600-1700	Russia, Radio Moscow Intl	9505na	9660eu	9705eu	9715eu	1630-1700	Egypt, Radio Cairo	15255af			
		9755eu	9825na	9860eu	11705na	1630-1700	United Kingdom, BBC London	3915as	5975as	6190af	6195eu
		11940na	11995na	12030na	12090na			7160as	9410eu	9515na	9630af
		15125as	15180na	15185am	15225as			9740va	11720as	11750as	12095va
		15290na	15355as	15425na	15540af			15070va	15260na	15310as	15400eu
		17700af	17735na	17760na	17790na			15420af	17860af	17880af	21470af
1600-1700	S Africa, Channel Africa	5960af	17710af					21660af			
1600-1700	Saudi Arabia, BSKSA	9705eu	9720eu			1630-1700	USA, VOA Washington DC	15255eu	17735eu	19379eu	
1600-1605	Singapore, SBC Radio One	5010do	5052do	11940do		1645-1700 s	Guam, KTRW Agana	15610as			
1600-1700	South Korea, Radio Korea	4945af	5975as	15220af		1645-1700	Tajikistan, Radio	7245as			
1600-1700	Sri Lanka, SLBC Colombo	6075as	9720as			1650-1700 mtwhf	New Zealand, R NZ Intl	9675pa			

SELECTED PROGRAMS

Sundays

- 1600 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1615 BBC: Feature. See S 0230.
 1645 BBC: Letter From America. See S 0615.

Mondays

- 1600 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1600 WWCR: Harvest-Time Revivals. Lee Sullivan presents an evangelical program.
 1615 BBC: New Ideas. A look at the latest technology, innovations, and new products.
 1615 WWCR: Day Of Challenge. Gary Lightfoot presents an evangelical program.
 1630 WWCR: Voice In The Wilderness. Tom Benvenuti presents an evangelical program.
 1635 BBC: Talks. Hear a capsule summary of a famous artist in "Artists In A Nutshell" (2nd).
 1645 BBC: The World Today. A look at a topical aspect of the international scene.
 1645 WWCR: The Living Word. Bobby and Mary Hoover presents an evangelical program.

Tuesdays

- 1600 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1600 WWCR: Harvest-Time Revivals. See M 1600.
 1615 BBC: Megamix. See T 1130.
 1615 WWCR: Day Of Challenge. See M 1615.
 1630 WWCR: Voice In The Wilderness. See M 1630.
 1645 BBC: The World Today. See M 1645.
 1645 WWCR: The Living Word. See M 1645.

Wednesdays

- 1600 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1600 WWCR: Harvest-Time Revivals. See M 1600.
 1615 BBC: Rock/Pop Music. See T 0630.
 1615 WWCR: Day Of Challenge. See M 1615.
 1630 WWCR: Voice In The Wilderness. See M 1630.
 1645 BBC: The World Today. See M 1645.
 1645 WWCR: The Living Word. See M 1645.

Thursdays

- 1600 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1600 WWCR: Harvest-Time Revivals. See M 1600.
 1615 BBC: Network UK. Issues and events affecting people across the UK.

- 1615 WWCR: Day Of Challenge. See M 1615.
 1630 WWCR: Voice In The Wilderness. See M 1630.
 1645 BBC: The World Today. See M 1645.
 1645 WWCR: The Living Word. See M 1645.

Fridays

- 1600 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1600 WWCR: Harvest-Time Revivals. See M 1600.
 1615 BBC: Science In Action. Latest in science and technology.
 1615 WWCR: Day Of Challenge. See M 1615.
 1630 WWCR: Voice In The Wilderness. See M 1630.
 1645 BBC: The World Today. See M 1645.
 1645 WWCR: The Living Word. See M 1645.

Saturdays

- 1600 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 1600 WWCR: The Old Country Church. Paul Smith presents an evangelical program.
 1615 BBC: Sportsworld. See A 1401.
 1630 WWCR: Victory Faith Healing Church. Joyce Corbett presents an evangelical program.
 1645 WWCR: Weekly Presidential Radio Address. See S 1245.

1700 UTC [1:00 PM EDT/10:00 AM PDT]

1700-1800	Algeria, Radio Algiers	9535me	17745af		
1700-1800	Australia, Radio	5995pa	6060pa	6080pa	7240pa
		9510pa	9580pa	11695pa	11880pa
		13755pa			
1700-1800	Azerbaijan, Voice of	15240as			
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, China Radio Intl	4130af	8260af	9570as	11575as
		15345as	15370as		
1700-1800	Costa Rica, R forPeace Int	7385am	15030na	21465am	
1700-1727	Czech Republic, R Prague	6055af	7345af	9490af	13600af
		15605af			
1700-1800	Ecuador, HCJB Quito	15270me	17790me	21455me	21480na
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800	Ghana, GBC Radio 1	4915do			
1700-1800 as	Guam, KSDA Agana	13720as			
1700-1715	Israel, Kol Israel	7465na	11587eu	11675eu	15640eu
1700-1800 vl	Italy, IRRS Milano	7125eu			
1700-1800	Japan, NHK/Radio Japan	9750na	11815as	11865as	
1700-1800	Jordan, Radio	9560eu			
1700-1735	Kazakhstan, R Alma Ata	9505eu	11825eu	15155eu	15270eu
		15285eu	15360eu	17605eu	17715eu
		17740eu	17910eu		
1700-1800 mtwhf	New Zealand, R NZ Intl	6035pa			
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9977af	13785af
1700-1730 s	Norway, Radio Norway Intl	9655eu	15220eu		
1700-1800	Pakistan, Radio	9420eu	11570eu		
1700-1755	Poland, Polish R Warsaw	7270eu	9525eu		
1700-1800	Russia, Radio Moscow Intl	9505na	9540na	9685na	9840na
		9860na	11705af	11940af	11960af
		11995na	12050na	12065af	15180as
		15290na	15355af	15385af	15395af
		15425na	15580na	17605na	17735na
		17760na	17790na		
1700-1800	S Africa, Channel Africa	4945af	11750af		
1700-1800	Saudi Arabia, BSKSA	9705eu	9720eu		
1700-1730	Sri Lanka, SLBC Colombo	6075as	9720as		
1700-1730	Switzerland, Swiss R Intl	9885af	13635af	15430af	17635af
1700-1730	United Kingdom, BBC London	3915as	6180eu	6195eu	7325eu
		9410eu	9515na	9740na	12095am
		15070am	15260af	15400af	15420af
		17880af	21660af		
1700-1800	USA, CSMonitor Boston MA	11580as	13625va	17510na	21640af
1700-1800 sa	USA, CSMonitor Boston MA	13710na	17555am		
1700-1800	USA, KCBI Dallas TX	15375va			
1700-1800	USA, KTNB Salt Lk City UT	15590am			
1700-1730	USA, VOA Washington DC	11920af	11995af	13710af	15445af
		17895af	19379eu		
1700-1800	USA, WEWN Birmingham AL	13615na			
1700-1800	USA, WHRI Noblesville IN	13760am	15105am		
1700-1800	USA, WJCR Upton KY	7490na	13595na		
1700-1800 smtwhf	USA, WMLK Bethel PA	9465eu			
1700-1800	USA, WRNO New Orleans LA		15420na		
1700-1800	USA, WWCR Nashville TN	13845am	15685am		
1700-1800	USA, WYFR Okeechobee FL	21500af			
1730-1800	Bulgaria, Radio	11720na	13670na		
1730-1800	Netherlands, Radio	6020af	7120af	21515af	21590af
1730-1800	Romania, R Romania Intl	15340af	15365af	17745af	17805af
1730-1800	Sweden, Radio	6065af	9645me	15270af	
1730-1800	United Kingdom, BBC London	6180eu	6195eu	7160me	7325eu
		9410eu	9740va	11720as	12095va
		15070va	15400af	15420af	17780af
		17880af	21660af		
1730-1800	Vatican State, Vatican R	11625af	15090af	17730af	
1745-1800	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		

1800 UTC [2:00 PM EDT/11:00 AM PDT]

1800-1900	Australia, Radio	5995pa	6060pa	6080pa	7240pa
		7260pa	9580pa	11855pa	11880pa
1800-1830	Belgium, R Vlaanderen	5910af	13685eu		
1800-1900	Brazil, Radiobras	15265eu			
1800-1900	Bulgaria, Radio	11720na	13670na		
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Costa Rica, R forPeace Int	7375am	7385am	13630am	15030am
		21465am			
1800-1900	Ecuador, HCJB Quito	21455am			
1800-1830	Egypt, Radio Cairo	15255af			
1800-1900	Ghana, GBC Radio 1	4915do			
1800-1900	Ghana, GBC Radio 2	7295do			
1800-1900 as	Guam, KSDA Agana	13720as			
1800-1900	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		
1800-1900 vl	Italy, IRRS Milano	7125eu			
1800-1900	Kuwait, Radio	13620na			
1800-1900	Netherlands, Radio	6020af	7120af	21515af	21590af
1800-1850 smtwhf	New Zealand, R NZ Intl	11735pa			
1800-1830 mtwhf	Portugal, Radio	9780eu			
1800-1900	Russia, Radio Moscow Intl	9685as	9890eu	11630af	11770as
		11995na	12015af	12050af	15150af
		15185af	15290na	15355me	15385af
		15425as	15580na	17605na	17760af
		17790na	17875as	21670me	
1800-1900	Saudi Arabia, BSKSA	9705eu	9720eu		
1800-1900	Sudan, Radio Omdurman	7200do	9165do		
1800-1900	Swaziland, Trans World R	3200af	9500af		
1800-1830	United Kingdom, BBC London	3255af	6180eu	6195eu	7160va
		7325eu	9410va	9740va	11720as
		11955au	12095va	15070va	15400af
		15420af	17880af		
1800-1900	USA, CSMonitor Boston MA	9455pa	15665eu	17510na	17612af
1800-1900 sa	USA, CSMonitor Boston MA	17555am			
1800-1900	USA, KCBI Dallas TX	15375am			
1800-1900 irreg	USA, KJES Mesquite NM	9510na			
1800-1900	USA, KTNB Salt Lk City UT	15590am			
1800-1900	USA, VOA Washington DC	3980me	6040eu	9700eu	9760eu
		11920af	11995af	13710af	15205eu
		15410af	15580af	17800af	17895af
		19379eu			
1800-1900	USA, WEWN Birmingham AL	15695na	18930na		
1800-1900	USA, WHRI Noblesville IN	13760na	17830na		
1800-1900	USA, WINB Red Lion PA	15295eu			
1800-1900	USA, WJCR Upton KY	7490na	13595na		
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900	USA, WRNO New Orleans LA		15420na		
1800-1900	USA, WWCR Nashville TN	13845am	15685am		
1800-1900	USA, WYFR Okeechobee FL	21500af			
1800-1830	Vietnam, Voice of	9840eu	12020eu	15010eu	
1815-1900	Bangladesh, Radio	9570me	12030eu		
1830-1900	Austria, R Austria Intl	5945eu	6155eu	9880me	13730me
1830-1900	Bulgaria, Radio	15330na			
1830-1855	Finland, Radio	6120eu	9730eu	11755eu	15440eu
1830-1900	Serbia, Radio Yugoslavia	6100eu	7200eu	17710af	
1830-1900	Slovakia, R Slovakia Intl	5915eu	7345eu	9605eu	
1830-1900	Sri Lanka, SLBC Colombo	9720eu	15120eu		
1830-1900	United Kingdom, BBC London	3255af	6180eu	6195eu	7325eu
		9410am	9740am	11955au	12095au
		15070au	15400af	15420af	17880af
		15070au	15400af	15420af	17880af
1835-1900	Kazakhstan, R Alma Ata	9505eu	11825eu	15155eu	15270eu
		15285eu	17605eu	17715eu	17740eu
		17910eu			
1840-1850 mtwhf	Greece, Voice of	15630af	17525af		
1850-1900 smtwhf	New Zealand, R NZ Intl	11735pa			

1900 UTC [3:00 PM EDT/12:00 PM PDT]

1900-2000	Algeria, Radio Algiers	9535eu	15205eu	17745eu	
1900-2000	Argentina, RAE	15345eu			
1900-2000	Australia, Radio	5995pa	6000pa	6060pa	6080pa
	7240pa	9580pa	11695pa	11720pa	11855pa
	11880pa	11910pa			
1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000	China, China Radio Intl	6955af	9440af	11515me	
1900-2000	Costa Rica, R forPeace Int	7385am	15030na	21465am	
1900-2000	Ecuador, HCJB Quito	17490va	17790eu	21455eu	21480eu
1900-1950	Germany, Deutsche Welle	9640af	11740af	11785af	11810af
		13790af	15350af	15390af	17765af
1900-1945	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		
1900-1930	Israel, Kol Israel	7465eu	9435eu	11585na	11603na
		11675eu	15640na	15650af	17575na
1900-2000 vl	Italy, IRRS Milano	7125va			
1900-2000	Japan, NHK/Radio Japan	9640am	9750as	11815pa	11865pa
		11875pa			
1900-2000	Kuwait, Radio	13620na			
1900-1930 s	Lebanon, King of Hope	6280me			
1900-2000 s	Morocco, RTV Marocaine	11920as			
1900-1930	Netherlands, Radio	6020af	7120af	17605af	17655af
		21590af			
1900-2000 smtwhf	New Zealand, R NZ Intl	11735pa			
1900-2000	Nigeria, Radio	3326do	4990do		
1900-2000	Nigeria, Voice of	7255af			
1900-1930 s	Norway, Radio Norway Intl	15355pa	15365am		
1900-1930 mtwhf	Portugal, Radio	17900af			
1900-2000	Romania, R Romania Intl	9750eu	11810eu	11940eu	15365eu
1900-2000	Russia, AWR Russia	9835eu			
1900-2000	Russia, Radio Moscow Intl	9685af	9725af	9785af	9860eu
	9890eu	11630eu	11760na	11770af	11880eu
	12015eu	12050eu	15150af	15180af	15290eu
	15355eu	15385af	15405af	15425na	15480af
	15580af	17560af	17605af	17760na	
1900-2000	Saudi Arabia, BSKSA	9705eu	9720eu		
1900-2000	Spain, Spanish Natl Radio	15375af			
1900-2000	Sri Lanka, SLBC Colombo	9720eu	15120eu		
1900-2000	Swaziland, Trans World R	3200af	3240af		
1900-1930	United Kingdom, BBC London	3255af	6005af	6180eu	6190af
	6195va	7160me	9410va	9630af	9740as
	12095va	15070va	15400af	17880af	11955au
1900-2000	USA, CSMonitor Boston MA	9445pa	15665eu	17510na	17612af
1900-2000 sa	USA, CSMonitor Boston MA	17555am			
1900-2000	USA, KCBI Dallas TX	15375va			
1900-2000	USA, KTNB Salt Lk City UT	15590am			
1900-2000	USA, VOA Washington DC	3980me	6040me	9525as	9700eu
	9760eu	11870as	11920af	11995af	13710af
	15205eu	15410af	15495af	15580af	17800af
	19379eu				17895af
1900-2000	USA, WEWN Birmingham AL	13615na	15695na		
1900-2000	USA, WHRI Noblesville IN	13760na	17830na		
1900-2000	USA, WINB Red Lion PA	15295eu			
1900-2000	USA, WJCR Upton KY	7490na	13595na		
1900-2000	USA, WMLK Bethel PA	9465eu			
1900-2000	USA, WRNO New Orleans LA	15420na			
1900-2000	USA, WWCR Nashville TN	13845am	15685am		
1900-2000	USA, WYFR Okeechobee FL	15355eu	21615af		
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu	
1910-1920	Botswana, Radio	3356af	4830af	7255af	
1930-2000	Iran, VOIRI Tehran	9022eu	15260eu		
1930-2000	Netherlands, Radio	17605af	21590af		
1930-2000	Poland, Polish R Warsaw	6135eu	7270eu	7285eu	9525eu
1930-2000	Saipan, KFBS Marpi	9465as			
1930-2000	United Kingdom, BBC London	3255af	6005af	6180eu	6190af
	6195va	7160me	9410va	9630af	9740as
	12095va	15070va	15400af	17880af	11955au
1935-1955	Italy, RAI Rome	7275eu	9710eu	11800eu	
1940-2000 mha	Mongolia, R Ulaanbaatar	11790eu	11850eu		
1950-2000	Vatican State, Vatican R	5885eu	7250eu		

2000 UTC [4:00 PM EDT/1:00 PM PDT]

2000-2100	Australia, Radio	5995pa	6000pa	6060pa	6080pa
	7240pa	9580pa	11695pa	11720as	11855pa
	11880pa	11910pa			
2000-2100	Bulgaria, Radio	11720eu	15330na		
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	China, China Radio Intl	9440af	9920eu	11500eu	11715af
		15110af			
2000-2100	Costa Rica, R forPeace Int	7385am	15030am	21465am	
2000-2027	Czech Republic, R Prague	6055eu	7300eu	7345eu	9490eu
2000-2100	Ecuador, HCJB Quito	17790eu	21455am	21480eu	
2000-2100	Ghana, GBC Radio 1	4915do			
2000-2100	Ghana, GBC Radio 2	7295do			
2000-2015 mtwhfa	Greece, Voice of	7450eu	9375eu		
2000-2100	Indonesia, Voice of	9675eu	11752eu		
2000-2030	Iran, VOIRI Tehran	9022eu	15260eu		
2000-2100 vl	Italy, IRRS Milano	7125va			
2000-2010 mtwhf	Kenya, Kenya BC Corp	4935do			
2000-2100	Kuwait, Radio	13620na			
2000-2100	Lebanon, King of Hope	6280me			
2000-2010 smwha	Mongolia, R Ulaanbaatar	11790eu	11850eu		
2000-2030	Netherlands, Radio	17605af	21590af		
2000-2100	New Zealand, R NZ Intl	11735pa			
2000-2100	Nigeria, Radio	3326do	4990do		
2000-2030	Nigeria, Voice of	7255af			
2000-2100	North Korea, R Pyongyang	6576eu	9345eu	9640af	9977af
2000-2100	Russia, Radio Moscow Intl	9785eu	9870eu	9890eu	11630af
	11675af	11730na	11750na	11760na	11770af
	12050na	15150af	15180af	15185eu	15290na
	15405af	15425na	15480af	15580na	17560af
	17690na	17720na	17760na		
2000-2100	Saudi Arabia, BSKSA	9705eu	9720eu		
2000-2045	Swaziland, Trans World R	3200af	3240af		
2000-2030	Switzerland, Swiss R Intl	9885af	12035af	13635af	15505af
2000-2100	Turkey, Voice of 9445eu				
2000-2030	United Kingdom, BBC London	5975na	6180eu	6195va	7160as
	7325eu	9410va	9740as	11955au	12095va
	15260sa	15340au	15400au	17880af	21660af
2000-2100	USA, CSMonitor Boston MA	9430as	9455as	15665eu	17510na
		17555sa			
2000-2100	USA, KCBI Dallas TX	15375va			
2000-2100	USA, KTNB Salt Lk City UT	15590am			
2000-2030	USA, VOA Washington DC	11720af	13710af	15160af	15410af
	15495af	15580af	17800af	17895af	21485af
2000-2100	USA, VOA Washington DC	6040me	9700eu	9760eu	15205eu
		19379eu			
2000-2100	USA, WEWN Birmingham AL	13615na			
2000-2100	USA, WHRI Noblesville IN	13760af			
2000-2100	USA, WJCR Upton KY	7490na	13595na		
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100	USA, WRNO New Orleans LA	15420na			
2000-2100	USA, WWCR Nashville TN	13845va	15685va		
2000-2100	USA, WYFR Okeechobee FL	15355eu	15566eu	17612af	21525eu
		21615eu			
2000-2030	Vatican State, Vatican R	9645af	11625af	15090af	
2005-2100	Syria, Radio Damascus	12085na	15095na		
2010-2100 sa	Kenya, Kenya BC Corp	4935do			
2025-2045	Italy, RAI Rome	7235me	9575me	11800me	
2030-2100	Canada, RCI Montreal	5995eu	7235eu	13650eu	13670af
	15325eu	17820af	17850af	17875af	
2030-2035	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
2030-2100	Egypt, Radio Cairo	15375af			
2030-2035	Latvia, Radio Riga	5935do			
2030-2100	Palau, KHBN Voice of Hope	9830as			
2030-2057	Slovakia, R Slovakia Intl	7345eu			
2030-2100	South Korea, Radio Korea	5975eu	6035af	9640me	9870eu
2030-2100	United Kingdom, BBC London	5975na	6005af	6180eu	6195va
	7325va	9410va	9630af	11955au	12095va
	15340au	15400af			
2030-2100	USA, VOA Washington DC	13710af	15410af	15495af	15580af
		17800af	17895af	21485af	
2030-2100	Vietnam, Voice of	9840eu	12020eu	15010eu	
2045-2100	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265pa		

2100 UTC [5:00 PM EDT/2:00 PM PDT]

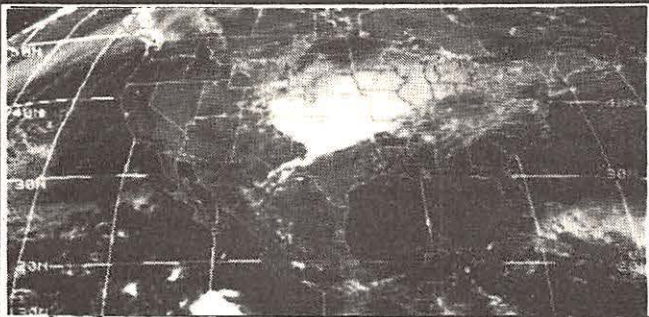
2100-2130	Australia, Radio	9645pa	11720pa	11855pa	11880pa
2100-2130	Belguim, R Vlaanderen	5910eu	9905eu		
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2129	Canada, RCI Montreal	5995eu	7235eu	13650eu	13670af
		15325eu	17820af	17850af	17875eu
2100-2200	China, China Radio Intl	4130eu	8260eu	9920eu	9940af
		11715af	15110af		
		7385am	15030na	21465na	
2100-2200	Costa Rica, R forPeace Int	17760eu			
2100-2200	Cuba, Radio Havana Cuba	17760eu			
2100-2130	Czech Republic, R Prague	6055eu	7300eu	7345eu	9490eu
2100-2130	Ecuador, HCJB Quito	21455va			
2100-2200	Egypt, Radio Cairo	15375af			
2100-2150	Germany, Deutsche Welle	9715af	9760as	9765as	11785as
		13690as	15135af	15350af	15360as
2100-2200	Ghana, GBC Radio 1	4915do			
2100-2200	Ghana, GBC Radio 2	7295do			
2100-2200	Hungary, Radio Budapest	6110eu	9835eu	11910eu	
2100-2200	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265pa		
2100-2200	Iraq, Radio Iraq Intl	11810eu	13680eu		
2100-2130 vl	Italy, IRRS Milano	7125va			
2100-2200	Japan, NHK/Radio Japan	6035eu	9640eu	9750eu	11815au
		11925eu	15430af		
2100-2130	Lebanon, King of Hope	6280me			
2100-2136 smtwhf	New Zealand, R NZ Intl	11735pa			
2100-2200	Nigeria, Radio	3326do	4990do		
2100-2130 s	Norway, Radio Norway Intl	15165na			
2100-2130 mtwhf	Portugal, Radio	15250af			
2100-2200	Romania, R Romania Intl	7195eu	7225eu	9750eu	11940eu
2100-2200	Russia, Radio Galaxy	11880eu			
2100-2200	Russia, Radio Moscow Intl	9480af	9530na	9685me	9725eu
		9750eu	9820eu	11730na	11760af
		12050na	15150as	15180af	15290na
		15405af	15480as	15580na	17605af
2100-2130	Serbia, Radio Yugoslavia	6100eu	7200eu	9505eu	
2100-2130	South Korea, Radio Korea	6480af	7550me	15575eu	
2100-2200	Spain, Spanish Natl Radio	6130eu			
2100-2200	Sri Lanka, SLBC Colombo	15120as			
2100-2200	Sweden, Radio	6065af	9655af		
2100-2105	Syria, Radio Damascus	12085na	15095na		
2100-2200	Ukraine, R Ukraine Intl	4825eu	6090eu	7150eu	7240eu
		7285eu	9600eu	9640eu	9685eu
		15570eu	17725eu	15135eu	15195eu
2100-2130	United Kingdom, BBC London	3225af	5975ca	6005af	6180eu
		6195va	7180pa	7325eu	9410eu
		12095va	15070af	15260sa	15340au
2100-2200	USA, CSMonitor Boston MA	9430as	9455as	15665eu	17510na
		17555sa			
2100-2200	USA, KCBI Dallas TX	15725am			
2100-2200	USA, KTNB Salt Lk City UT	15590na			
2100-2200	USA, VOA Washington DC	6040me	9700eu	9760eu	11870as
		11960eu	13710af	15185as	15205eu
		15580af	17735as	17800af	17895af
2100-2200	USA, WEWN Birmingham AL	13615na			
2100-2200	USA, WHRI Noblesville IN	13760na			
2100-2200	USA, WINB Red Lion PA	15185eu			
2100-2200	USA, WJCR Upton KY	7490na	13595va		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200	USA, WRNO New Orleans LA		15420na		
2100-2200	USA, WWCN Nashville TN	13845va	15685va		
2100-2200	USA, WYFR Okeechobee FL	15565eu	17612eu	17750af	21525eu
		21615eu			
2100-2110	Vatican State, Vatican R	5885eu	7250eu		
2103-2110	Croatia, Croatian Radio	9830eu	13830eu		
2110-2200	Syria, Radio Damascus	12085na	15095na		
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130 mtwhf	United Kingdom, BBC Carib	15390ca	17715ca		
2130-2200	Albania, R Tirana Intl	9760eu	11840eu		
2130-2200	Australia, Radio	9645pa	11720pa	11855pa	11880pa
		15240pa	15320pa	17795pa	21740pa
2130-2200	Austria, R Austria Intl	5945eu	6155eu	9880eu	13730af
2130-2200	Ecuador, HCJB Quito	17490va	17790eu	21455va	21480eu
2130-2200	Finland, Radio	6120eu	11755eu	15440eu	
2130-2200	Israel, Kol Israel	7465na	9435na	11587na	11603na
		11675eu	15640eu	15650na	17575sa
2130-2200 smtwhf	Lebanon, King of Hope	6280me			
2130-2200	Lithuania, Radio Vilnius	9675eu	9710eu		
2130-2200	Serbia, Radio Yugoslavia	6100eu	9720eu		
2130-2200	Sweden, Radio	6065eu	9655pa	11955as	
2130-2200	United Kingdom, BBC Flk Is	13660sa			

2130-2200	United Kingdom, BBC London	3225af	5975ca	6005af	6180eu
		6195va	7180pa	7325eu	9410eu
		12095va	15070af	15260sa	15340au
2139-2200	New Zealand, R NZ Intl	15120pa			
2140-2200 s	Eqt Guinea, Radio Africa	7190af			
2145-2200	Bulgaria, Radio	11720na	15330na		
2145-2200	South Korea, Radio Korea	6480eu	15575eu		

2200 UTC [6:00 PM EDT/3:00 PM PDT]

2200-2230	Albania, R Tirana Intl	9760eu	11825eu		
2200-2230	Australia, Radio	9540as	9645pa	11720pa	11855as
		11880pa	15240pa	15320pa	15365pa
2200-2300	Bulgaria, Radio	11720na		15330na	
2200-2300	Canada, CBC Northern Svc	9625do			
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, RCI Montreal	5960na	5995eu	7195eu	9755na
		11705as	11730ca	11875na	13670ca
2200-2300	China, China Radio Intl	9880eu			
2200-2300	Costa Rica, R forPeace Int	7385ca	15030ca	21465ca	
2200-2230	Cuba, Radio Havana Cuba	6180va			
2200-2230	Czech Republic, R Prague	5960eu	6055eu	7345eu	9605eu
2200-2245 s	Egypt, Radio Cairo	9900eu			
2200-2258 s	Eqt Guinea, Radio Africa	7190af			
2200-2245	Finland, Radio	9730eu	11740eu	11810eu	
2200-2300	Ghana, GBC Radio 1	4915do			
2200-2300	Ghana, GBC Radio 2	7295do			
2200-2230	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265eu		
2200-2225	Italy, RAI Rome	5990as	9710as	11800as	
2200-2300 smtwha	Malaysia, RTM Radio 4	7295do			
2200-2300	New Zealand, R NZ Intl	15120pa			
2200-2300	Nigeria, Radio	3326do	4990do		
2200-2300	Palau, KHBN Voice of Hope	9830as			
2200-2300	Russia, Radio Moscow Intl	7150eu	7300eu	9480af	9530na
		9685eu	9715eu	9725eu	9815eu
		11905af	12050na	15290na	15410na
		17675af	17720na		
2200-2300	Singapore, SBC Radio One	5010do	5052do	11940do	
2200-2230	South Korea, Radio Korea	7275as	9640as		
2200-2245	South Korea, Radio Korea	6480eu	15575eu		
2200-2230	Switzerland, Swiss R Intl	5995am	9810am	9885am	12035am
2200-2210	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	17750eu	21720eu		
2200-2300	Turkey, Voice of	7185me	9445na	11895eu	
2200-2300	UAE, Radio Abu Dhabi	11885na	15305na	15315na	
2200-2300	Ukraine, R Ukraine Intl	4795eu	6020eu	7195eu	7240eu
		9710eu	9860eu		
2200-2300	United Kingdom, BBC London	5970eu	5975na	6195va	7325eu
		9410af	9570pa	9590na	9750as
		11955pa	12095af	15070va	15260sa
2200-2300	USA, CSMonitor Boston MA	9465na	13625as	15665eu	17555sa
2200-2300	USA, KCBI Dallas TX	15725va			
2200-2300	USA, KTNB Salt Lk City UT	15590am			
2200-2300	USA, VOA Washington DC	7120as	7140as	7215as	9770as
		11760as	15185as	15290as	15305as
2200-2300	USA, WEWN Birmingham AL	7425am	11820am		
2200-2300	USA, WHRI Noblesville IN	13760eu			
2200-2245	USA, WINB Red Lion PA	15185eu			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300	USA, WRNO New Orleans LA		15420na		
2200-2300	USA, WWCN Nashville TN	13845am			
2200-2300	USA, WYFR Okeechobee FL	17612na	21525eu		
2200-2230 s	USA, KGEI San Francisco CA	15280sa			
2202-2216	Congo, RTV Congolaise	4765af	5985af		
2203-2209	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
2230-2300	Australia, Radio	9645pa	11720pa	11855pa	11880pa
		15240pa	15320pa	17795pa	21740pa
2230-2300	Canada, RCI Montreal	5960am	5995eu	7195eu	9755am
		13670am			
2230-2300	Sweden, Radio	6065pa	11910pa		
2240-2250 smtwhf	Greece, Voice of	11645au			
2245-2300	Armenia, Radio Yerevan	11920na	11945na	15385na	
2245-2300	India, All India Radio	9910as	11745as	11785as	15110as
		15145as			
2245-2257	Iraq, Radio Iraq Intl	15180na	17940na		
2245-2300	USA, WINB Red Lion PA	15145eu			
2245-2300	Vatican State, Vatican R	9600as	11830as	15090pa	

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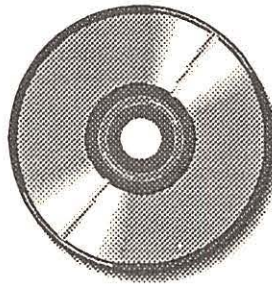
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2300 UTC

[7:00 PM EDT/4:00 PM PDT]

FREQUENCIES

2300-2400	Australia, Radio	11720pa	11855pa	11880pa	15240pa	2300-2400	Singapore, SBC Radio One	5010do	5052do	11940do
		15320pa	15365pa	17795pa	21740pa	2300-2330	Sweden, Radio	6065pa	11910pa	
2300-2315	Bulgaria, Radio	11720na	15330na			2300-2400	Thailand, Radio	9655as	11905as	
2300-2400	Canada, CFCX Montreal	6005do				2300-2400	UAE, Radio Abu Dhabi	11885na	15305na	15315na
2300-2400	Canada, CFRX Toronto	6070do				2300-2330	United Kingdom, BBC London	5970eu	5975na	6175na
2300-2400	Canada, CFVP Calgary	6030do						7180as	7325eu	9410na
2300-2400	Canada, CHNX Halifax	6130do						9590na	9915sa	11750sa
2300-2400	Canada, CKZU Vancouver	6160do						11955va	12095na	15070am
2300-2400 mtwhf	Canada, RCI Montreal	5995eu	7195eu	9755na	13670na			15280as	15400as	
2300-2400 as	Canada, RCI Montreal	5995eu	7195eu	9755na	11904na	2300-2400	USA, CS Monitor Boston MA	9465na	13625as	15665eu
		13670na	15235na			2300-2400	USA, KCBI Dallas TX	15725va		17555am
2300-2400	Costa Rica, AWR Alajuela	9725ca	11870ca			2300-2400	USA, KTNB Salt Lk City UT	15590na		
2300-2400	Costa Rica, R for Peace Int	7385na	13630na	15030na	21465na	2300-2400	USA, VOA Washington DC	7120as	7140as	7215as
2300-2400	Ecuador, HCJB Quito	9745am	21455am					11760as	15185as	15290as
2300-2315 a	Eqt Guinea, Radio Africa	7203af						17735as	17820as	
2300-2305	Ghana, GBC Radio 1	4915do				2300-2400	USA, WEWN Birmingham AL	7425am		
2300-2305	Ghana, GBC Radio 2	7295do				2300-2400	USA, WHRI Noblesville IN	13760am		
2300-2400	Guam, KSDA Agana	15610as				2300-2400	USA, WINB Red Lion PA	15145eu		
2300-2400	India, All India Radio	9910as	11745as	11785as	15110as	2300-2400	USA, WJCR Upton KY	7490na	13595na	
		15145as				2300-2400	USA, WWCR Nashville TN	13845am	15685am	
2300-2355	Japan, NHK/Radio Japan	6060eu	6125eu	7140eu	15430as	2300-2315	Vatican State, Vatican R	9600as	11830as	15090pa
		17810as				2315-2330	United Kingdom, BBC London	6110sa	9560sa	9825sa
2300-2330	Kazakhstan, R Alma Ata	5915eu	7255eu					15390sa		11765sa
2300-2330	Kazakhstan, R Alma Ata	7255as				2330-0000	Belgium, R Vlaanderen	9930am	13655am	
2300-2330	Lithuania, Radio Vilnius	11750na				2330-2400 a	Colombia, Radio Nacional	11822.5	17865am	
2300-2400 smtwha	Malaysia, RTM Radio 4	7295do				2330-2400	Netherlands, Radio	6020na	6165na	
2300-2400	New Zealand, R NZ Int'l	15120pa				2330-2400 m	Sri Lanka, SLBC Colombo	15425am		
2300-2350	North Korea, R Pyongyang	11700am	13650am			2330-2400	Sweden, Radio	6065eu	11910eu	
2300-2330 s	Norway, Radio Norway Int'l	9655am	11795am			2330-2400	United Kingdom, BBC London	5975na	6175na	6195as
2300-2400	Palau, KHBN Voice of Hope	9830as						9570as	9590na	9915sa
2300-2400	Russia, Radio Moscow Int'l	7300na	9480na	9815eu	11720na			11945as	11955va	12095na
		11805na	11840na	11905na	12050na			15260sa	15280as	
		15410na	15425na	15535as	17560as	2330-2400	Vietnam, Voice of	9840as	12020as	15010as
		17570as	21625as	21670as	21690as	2335-2345 smtwhf	Greece, Voice of	9425am	11595sa	11645am
2300-2310	Sierra Leone, SLBS	3316do				2345-2357	Iraq, Radio Iraq Int'l	15180na	17940na	

SELECTED PROGRAMS

Sundays

- 2300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 2300 WWCR: World Of Radio. See S 0305.
 2305 BBC: World Business Review. The previous week's news and upcoming events.
 2315 BBC: Ray On Record. Robin Ray presents selections of classical music.
 2330 WWCR: The Gospel Hour. Malcolm Lavender presents an evangelical program.
 2336 Radio Vlaanderen Int'l: P Box 26. See S 0636.
 2345 WWCR: In The Holy Land. A program from Israel Broadcasting.
 2349 Radio Vlaanderen Int'l: Music From Flanders. See S 0649.

Mondays

- 2300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 2305 BBC: World Business Report. The latest news from the markets worldwide.
 2315 BBC: On Screen. Movies and movie business reports.
 2330 BBC: Multitrack 1. Tim Smith presents the smash singles on the UK pop charts.
 2330 WWCR: New Talk Program. A program from FAME.
 2334 Radio Vlaanderen Int'l: Press Review. See M 0634.
 2337 Radio Vlaanderen Int'l: Belgium Today. A review of current affairs and events.
 2342 Radio Vlaanderen Int'l: Focus On Europe. Happenings, events, and politics in Europe.
 2347 Radio Vlaanderen Int'l: Sports. A roundup of events in the sports world.

Tuesdays

- 2300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 2305 BBC: World Business Report. See M 2305.
 2315 BBC: Concert Hall. Classical music from the world's great concert halls.

- 2330 WWCR: New Talk Program. See M 2330.

- 2334 Radio Vlaanderen Int'l: Press Review. See M 0634.
 2337 Radio Vlaanderen Int'l: Belgium Today. See M 2337.
 2342 Radio Vlaanderen Int'l: Around The Arts. Developments in the arts in Belgium.
 2347 Radio Vlaanderen Int'l: P Box 26. See S 0636.

Wednesdays

- 2300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 2305 BBC: World Business Report. See M 2305.
 2315 BBC: From Our Own Correspondent. See S 0330.
 2330 BBC: Multitrack 2. Graham Bannerman presents new pop records, interviews, news, and competitions.
 2330 WWCR: New Talk Program. See M 2330.
 2334 Radio Vlaanderen Int'l: Press Review. See M 0634.
 2337 Radio Vlaanderen Int'l: Belgium Today. See M 2337.
 2342 Radio Vlaanderen Int'l: Living In Belgium. Everyday life in the low countries.
 2347 Radio Vlaanderen Int'l: Green Society. The environmental concerns of Belgians.

Thursdays

- 2300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 2305 BBC: World Business Report. See M 2305.
 2315 BBC: Music Review. News and features from the world of classical music.
 2330 WWCR: New Talk Program. See M 2330.
 2334 Radio Vlaanderen Int'l: Press Review. See M 0634.
 2337 Radio Vlaanderen Int'l: Belgium Today. See M 2337.
 2342 Radio Vlaanderen Int'l: Economics. A review of economic developments.
 2350 Radio Vlaanderen Int'l: North-South. Development in Africa and other Third World regions.

Fridays

- 2300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 2305 BBC: World Business Report. See M 2305.
 2315 BBC: Worldbrief. A roundup of the week's news headlines and developments.
 2330 BBC: Multitrack 3. Sarah Ward presents the latest from the alternative pop scene.
 2330 WWCR: New Talk Program. See M 2330.
 2334 Radio Vlaanderen Int'l: Press Review. See M 0634.
 2337 Radio Vlaanderen Int'l: Belgium Today. See M 2337.
 2342 Radio Vlaanderen Int'l: Around The Arts. See T 2342.
 2350 Radio Vlaanderen Int'l: P Box 26. See S 0636.

Saturdays

- 2300 WWCR (Program 2): Univ Network Cathedral. See S 0000.
 2300 WWCR: The Jazz Connection. A program from Michael Brannon.
 2305 BBC: Words Of Faith. See M 1209.
 2310 BBC: Book Choice. See W 0425.
 2315 BBC: A Jolly Good Show. See T 1515.
 2315 WWCR: The Blessed Word Of Life. Perry Johnson presents an evangelical program.
 2330 WWCR: The People's Gospel Hour. Perry F. Rockwood presents an evangelical program.
 2334 Radio Vlaanderen Int'l: Press Review. See M 0634.
 2337 Radio Vlaanderen Int'l: Radio World. See M 0637.
 2340 Radio Nacional, Bogota: Feature. Topical programming on various issues.
 2347 Radio Vlaanderen Int'l: Tourism In Flanders. See M 0647.
 2350 Radio Nacional, Bogota: Colombia DX. News for shortwave radio listeners.

TONE READING IMPROVED!!!

DECODE...CTCSS-50, DTMF-16, DCS-105



OPTOELECTRONICS

Monitoring off-the-air signalling tones such as private line and DTMF (Touchtones®) has always involved compromises—tiny displays, ambiguous readouts and poor response time. *No Longer!*

Optoelectronics has applied world class engineering to the problem and set a new standard for inexpensive tone reading equipment. This unit was designed to fill a function, not meet a price—yet it is competitive with other, less featured units. A micro-processor measurement system makes the unit precise and enables future expansion of capabilities.

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- Stores most recent CTCSS or DCS tone

- Convenient front panel controls
- Upgrade older service monitors
- Use with scanner or receiver (may require internal connection for CTCSS)
- Direct connection to Optoelectronics R10 Interceptor
- Ideal for two-way service technicians, hams and monitoring hobbyists
- 2 line by 16 character backlit LCD display
- Low power battery operation optional
- Precise Switched Capacitor audio filtering
- OE10 INSIDE high speed frequency counter ASIC
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SPECIFICATIONS

Function:	CTCSS and DTMF decoding and display
Display:	2 x 16 character LCD dot matrix/EL Backlight
Controls:	Power, Mode, Recall
Inputs:	1/8" Phone jack, greater than 400 kΩ impedance
Output:	Serial Data (I/O)
Power Req.	7 - 15 VDC
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OPTION:	NiCad 44 \$39.
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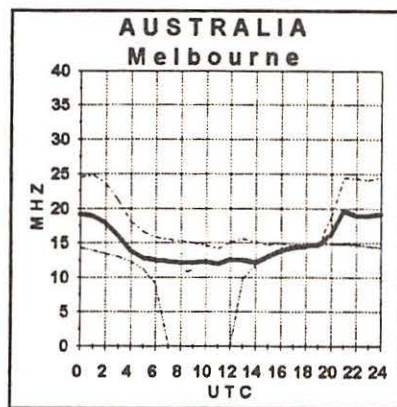
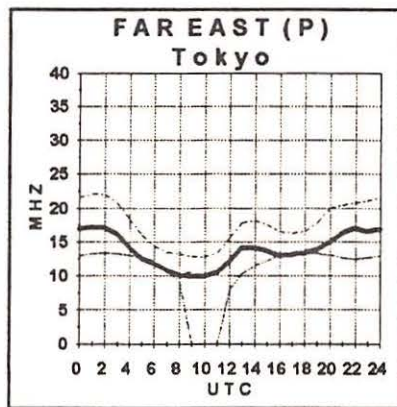
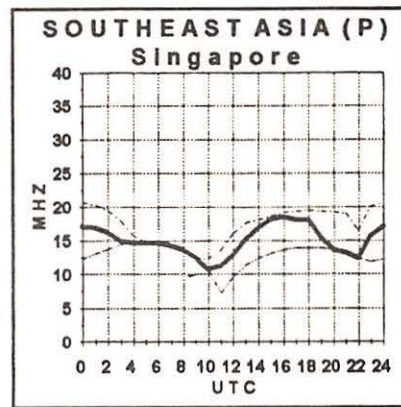
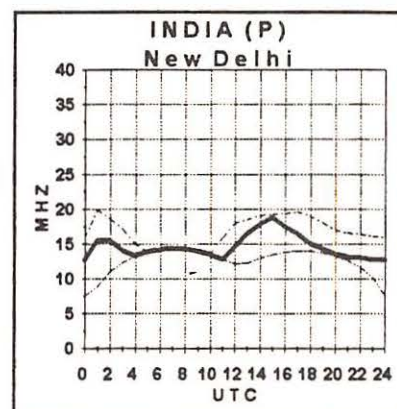
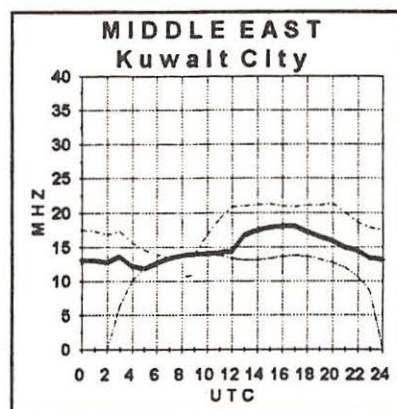
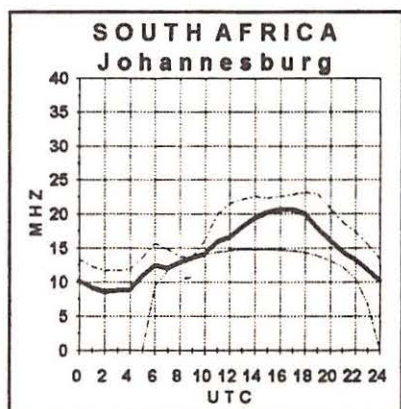
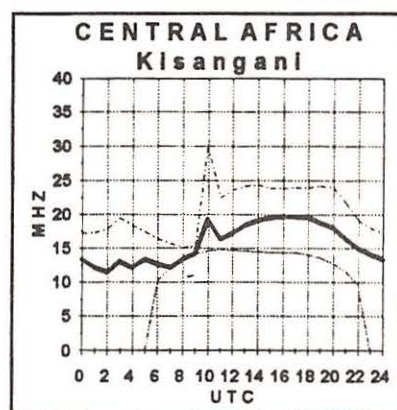
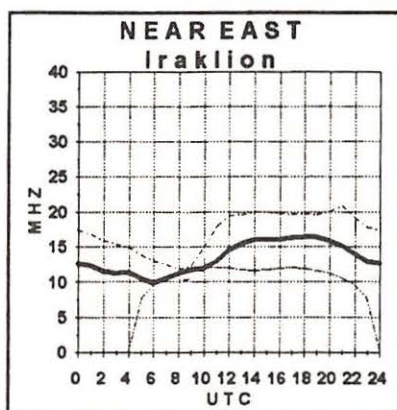
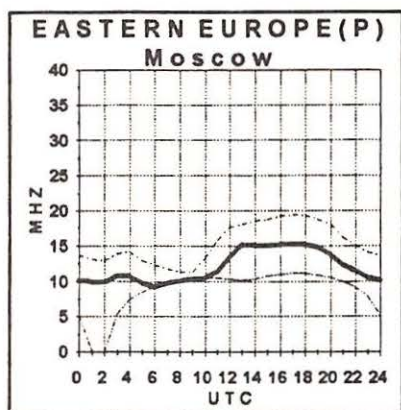
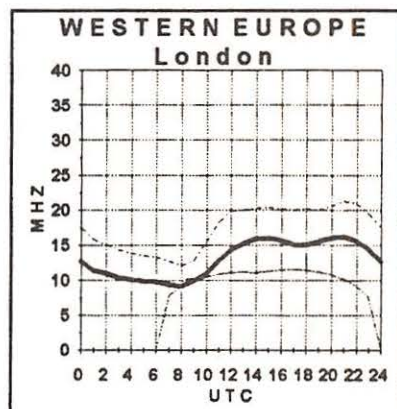
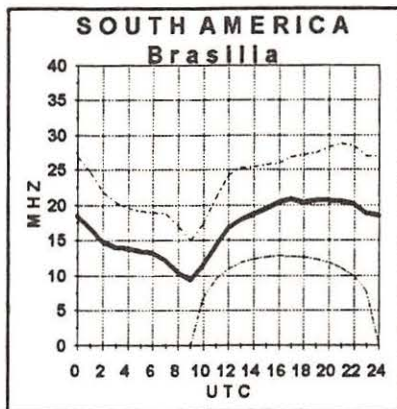
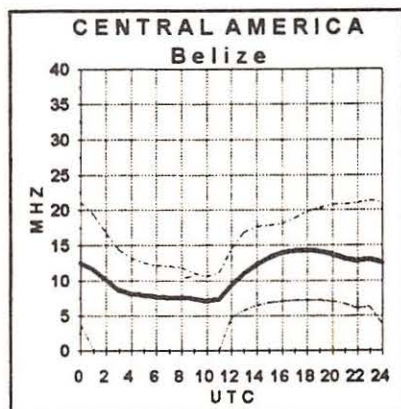
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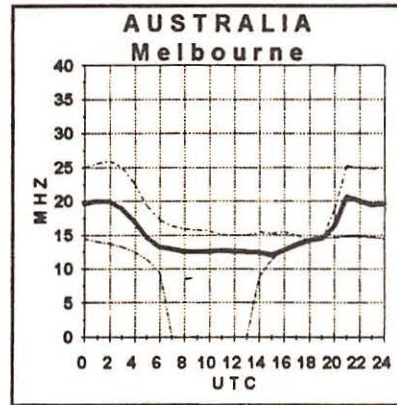
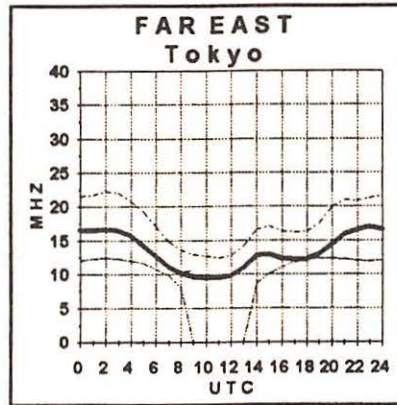
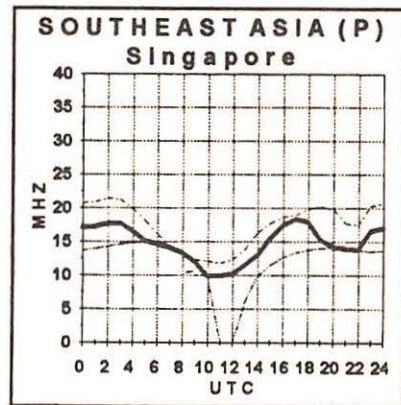
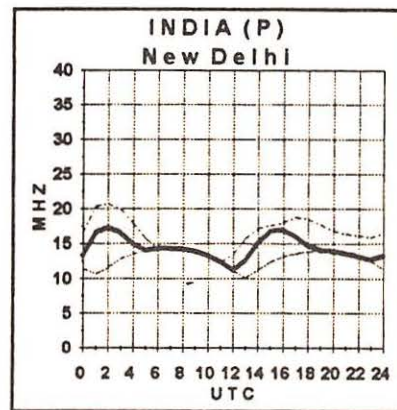
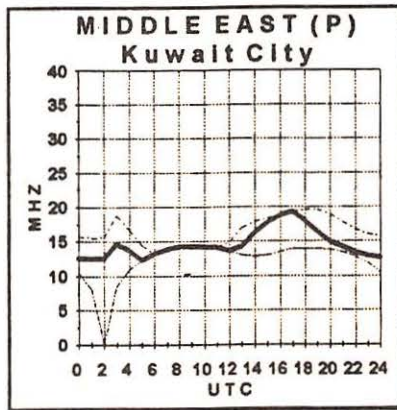
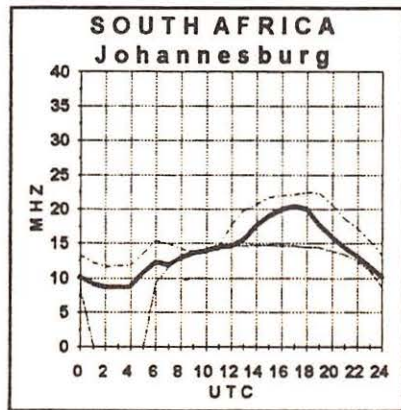
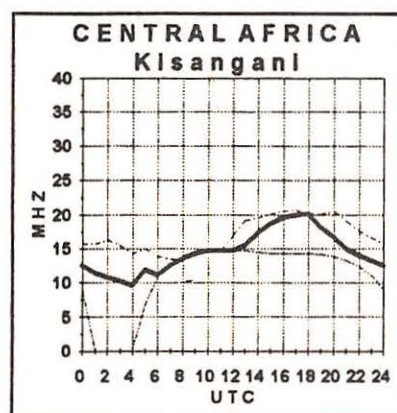
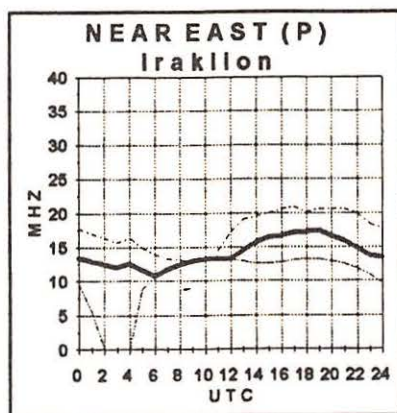
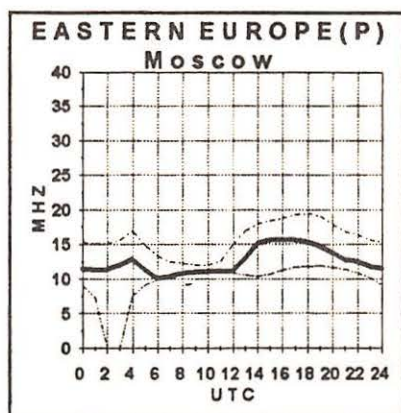
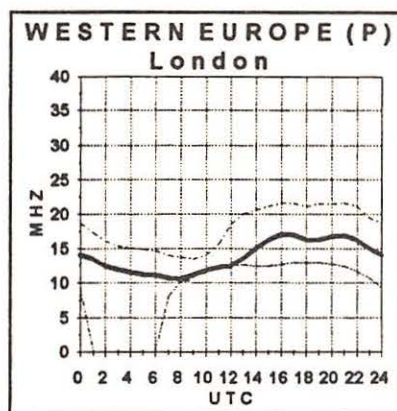
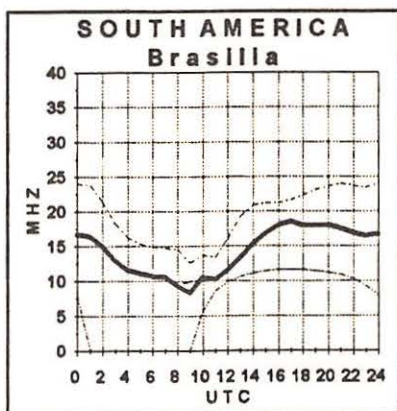
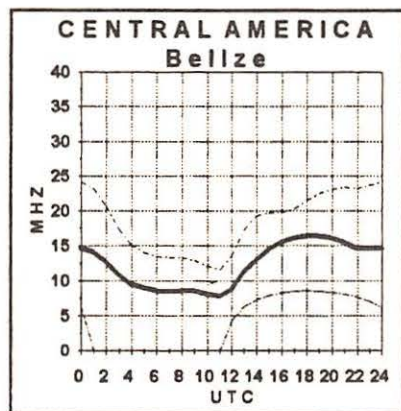
Propagation conditions: Eastern United States

How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear.



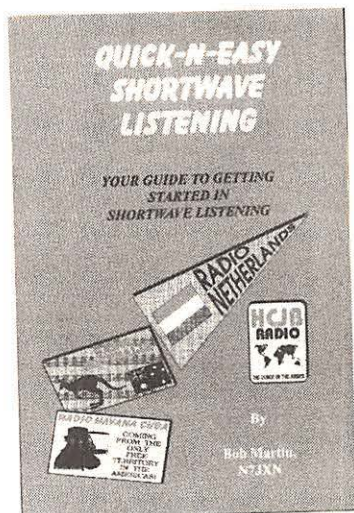
Propagation Conditions: Western United States

Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances.



what's new?

Larry Miller



Very Easy Shortwave

Quick-N-Easy Shortwave Listening is a new, 81-page "intro to shortwave" book by Bob Martin. The book is well thought out, covering all the basics, like "What is Shortwave Radio?" "How to Choose a Receiver," and "A Trip Through the Bands."

There is little jargon. And there's an innocent, genuine enthusiasm that pervades the author's writing throughout. You can tell that Martin is a nice guy; his style is that of a favorite uncle talking to a young nephew about shortwave.

Here's an example: "I wonder why almost all the American shortwave stations are religious stations? Oh, well, not my cup of tea I guess. Maybe There's [sic] an audience enjoying it though. Hey, Radio Japan has a nice signal this time of day on 11865. I think I heard that it is coming from their relay sight [sic] in Canada, but I'm not sure about that. All I know is that they have some good programming."

OK, so maybe I'm getting too

old and cranky, but the book seems just a little too "sing-songy": a little too simplistic. It could also do with some better proofreading.

The graphics are equally simple. Page 50 is a desk-top publishing graphic of a jet with the caption that says, "With Shortwave Radio you can take a trip around the world every night, right from your easy chair!" Maybe that's just right for the average person who isn't yet sold on shortwave. But if that's the case, why did they buy the book?

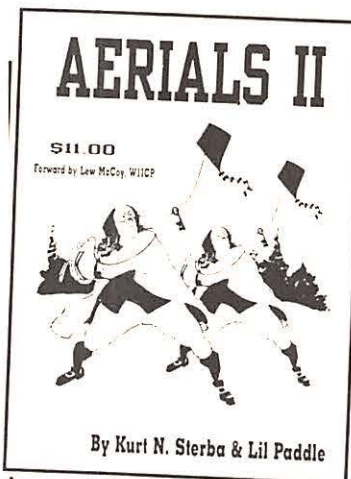
Artsci took good advantage of *Quick-n-Easy* as a convenient advertising tool. There are some seven full page ads for the publisher (none others). That's almost 10 percent. There are seven pages of frequencies from the strongest international broadcasters, and the book concludes with 14 pages of blank log sheets and an ad for — you guessed it — the publisher.

Nevertheless, for the potential shortwave broadcast listener in your life, *Quick-n-Easy Shortwave Listening* may be just the reading needed for an enthusiastic start. It's available from artsci, P.O. Box 1428, Burbank, California 91507 for \$9.95 plus \$3.95 shipping.

Aerials II

Kurt Sterba writes a popular, widely-reviled antenna column for *Worldradio*, a ham radio magazine. The gist of the column is that Sterba tweaks the conventional thinking about ham radio antennas in a lovable, rascally way. It makes for some interesting reading (Like the time Sterba wired together two shopping carts with a Budwig connector to work 34 sections, including four Canadian provinces, plus a DX station 5,000 miles away.)

His point is: you don't need a



fancy antenna to participate in ham radio. *Aerials II* is the second "best of Kurt" book compiled from the columns. It's available from *Worldradio*, P.O. Box 189490, Sacramento, California 95818 for \$11.00 plus \$2.00 shipping and handling.

Me, a Ham?!

Want to get your ham license? Got a weekend and \$99.00? The ARRL is now offering a 5-hour video course that Public Information Officer Steve Mansfield says "gives you everything you need to know to get your first Amateur license." Sure, if you've got a Ph.D. in electrical engineering.

No, says Steve, "Even people without an electronics background can use the course to get a license in an easy weekend of study."

We decided to put this one to the test. Bob Grove has been on me for the past ten years or so to get my ham license. So here we go. The ARRL is going to send me the course. I'll take it, promising to use due diligence in preparing for the test.

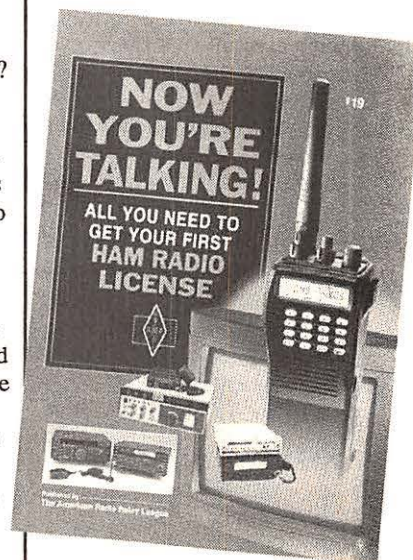
Believe me, if this thing can get me to pass my ham test, it'll work for anyone. Stay tuned over the next few issues and we'll keep you up to date on the results.

For those who don't want to wait, you can get your copy of the 5-hour video course, review book and sample questions for \$99.00 from the ARRL, 225 Main Street, Newington, Connecticut 06111. Tell 'em *MT* sent you.

Now You're Talking!

If you're interested in getting your ham radio ticket the more traditional way, it has never been easier. The American Radio Relay League (ARRL) has updated their enormously popular ham radio license guide to include the latest questions and answers with their easy-to-learn study materials.

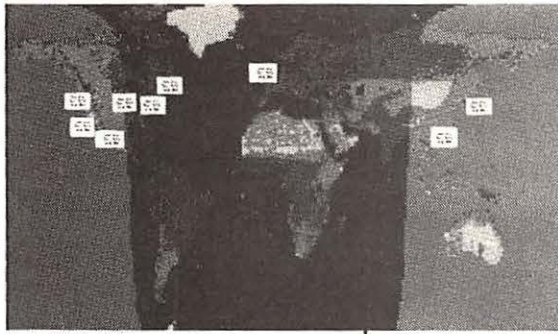
Now You're Talking explains the differences between the Novice and Technician grades, amateur radio basics, practical ham radio hints, theory of components and circuits, glossary of terminology, question pools for Novice and Technician tests—with answers—and even the FCC application form. A must for any ham radio prospect.



This 400-page book, published by the ARRL (address above), is available from Grove Enterprises (\$18.95 plus \$2 shipping), the ARRL, and other *MT* advertisers.

Sun Screen

It's the difference between day and night on your computer monitor. Featuring an outstanding global map which shows the night shadow for any specified day and time, Palo Alto Software's *Sun Clock* may have unique applicability for the radio listener or amateur radio operator.



The Sun Clock was intended primarily for the traveler or businessman who is calling locations around the world. A click of the mouse brings up the time of day or night and the date for that area of the world. An associated notepad can bring up business contacts and phone numbers — or, station names and favorite frequencies for that region!

The limits of the program restrict the hobbyist to twenty pop-up notepads, each containing eight lines 35 characters long—enough to recall your favorite listening targets!

Sun Clock 4.0 is available for the Macintosh, and should be available for Windows by press time. Suggested retail is \$39.95, but can be purchased for less at local outlets. Call Palo Alto Software (2641 Columbia St., Eugene, OR 97403) at [800] 229-7526 for the dealer nearest you. And tell them *MT* sent you!

Power Out

One of the most frustrating things about using a radio to monitor the airwaves during an emergency is the possibility that the emergency will knock out the electricity. That — unless you are smart enough to have a handful of well-charged batteries — leaves you without your radio at the very time you need it most.

Backwoods Solar Electric Systems offers a free, informative, 106 page catalog of alternative energy sources and storage. There's everything from solar panels to wind generators, special long-life batteries for plenty of power, super-efficient lighting for the shack, generators and more. It's fascinating stuff.

the emergency needs of your family or community.

Drop a note to Steve and Elizabeth Wiley (KC7BX, WB7VAD) and tell them you don't want to be left in the dark anymore. Their address is 8530 Rapid Lightning Creek Road, Sandpoint, Idaho 83864 or call 208-263-4290.

Virginia Frequency Directory

You may think that you have seen giant, personal frequency files, but not until you have seen this set can you make that claim! John Wilson's database covers 25-2000 MHz and covers virtually every mode and licensee in the civilian and government sectors that can be heard in the Commonwealth of Virginia, including Washington, D.C. Most come from official sources and have been verified.

In order to compress the massive amount of data into reasonably-sized books, Wilson uses a microfont which is somewhat difficult to read, but no more so than *Police Call*. The master database consists of more than 54,000 frequency entries on a ream of paper.

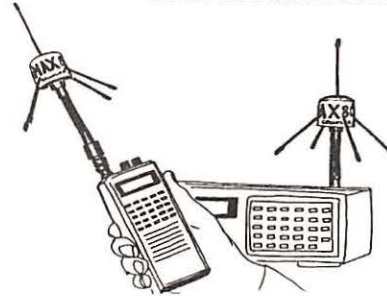
Data fields include frequency, service, callsign, user identity, city, county, and channel designator. Other fields include repeater, mobile or base assignments; presence and frequency of subaudible tone squelch if known; and comments to further identify the channel and its user.

Prices vary from \$15 (aviation only) to \$125 (master file), plus \$6 shipping from John Lee Wilson, 6413 Bull Hill Rd.,

The next time the power goes down, your shack could be the only place in the neighborhood with lights, ready to handle

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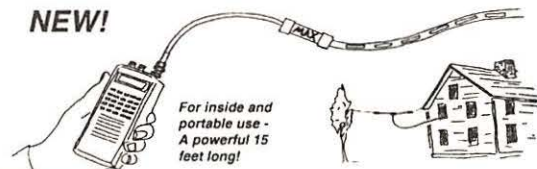
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Free Newsletter

NuTechnology Newsletter is a new, weekly publication for hams and hobbyists that covers the fields of RF, audio, consumer electronics, radio, computer science, biotechnology, telecommunications, and space. The publication will scan important periodicals plus print press releases and technical articles by manufacturers.

Monitoring Times has arranged for you to receive six issues of *NuTechnology* free of charge. All you have to do is send six #10 self-addressed, stamped envelopes (29 cent stamp) to Hart Publishing, 767 South Xenon Court, Suite 117, Lakewood, Colorado 80228 and you'll

receive an issue every other Friday.

You must mention *Monitoring Times*' "What's New" column in order to get the free subscription.



New Cobra CB

The Cobra HH-70 Mobile CB Radio is a compact, 1-piece handheld CB that includes all controls, including microphone and speaker, in a sleek microphone-shaped unit.

Check out the picture of this thing: Completely self-contained, it's a full-power CB transceiver.

The handheld unit features a multi-function LCD display with continuous backlighting, electronic up/down channel tuning, one-button Emergency Channel 9 selection, and key-lock switch to prevent accidental channel changes.

A five-foot curled cord that contains the power and antenna connections. The cord is connected to a small remote-mount module that features an external speaker jack. The connector box is only 2.25"W x 1.50"H x 1.25" D.

The Cobra HH-70 has a \$109.95 suggested retail price. You can check it out at your favorite radio store.



Transferable Antenna

K40 Electronics has introduced their new K30 CB antenna with a 3-inch wide magnetic mount for easy mounting and removal. In fact, the transferability — from one car to another — is the selling point of the K30. The magnet holds the unit in place at speeds in excess of 120 miles per hour, but can be easily removed for use on another vehicle or put in storage.

The antenna also features a wide, base-loaded coil, 15 feet of pre-wired coax and a radiused tip that eliminates static build-up. For more information or the name of the K40 Electronics dealer nearest you, call 312-565-0044.

AM DX Tool

You're sitting down, doing a little AM DXing. Imagine that you're on 1400 kHz with a very weak signal. Out of the static and mixture of voices you hear someone say, "and today the Fremont County sheriff ar-

rested..." but it quickly fades away. A great, possibly incredible DX catch slips away, right? Wrong.

The always amazing National Radio Club now has a county cross reference available and all you have to do is look up Fremont county to see what state it's in and the call letters of the station you're hearing. You have snatched a super DX catch from the jaws of failure.

The NRC cross reference book contains an alphabetical list of counties from the US and Canada, cross referenced by state. The booklet is 76 pages and just \$8.95 postpaid from the National Radio Club, P.O. Box 164-MT, Mannsville, New York 13661.

Amateur Radio Encyclopedia

From absorption wavemeter to Zurich sunspot number, this single-volume, fully-illustrated encyclopedia provides a practical overview of all topics related to amateur radio.

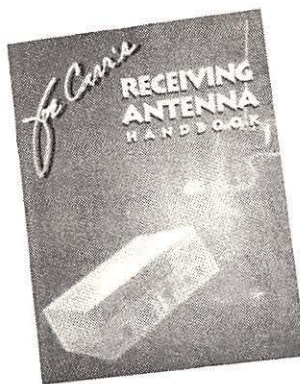
With 600 pages of alphabetically arranged, thoroughly cross-referenced articles on more than 100 topics, the *Amateur Radio Encyclopedia*, says the publisher, "is a natural edition to any school or public library."

Amateur Radio Encyclopedia is available for \$50.00 (hard-cover) from Tab Books, Blue Ridge Summit, Pennsylvania 17294 or call 717-794-2191.

Receiving Antenna Handbook

Long-time hobbyists and newcomers alike should recognize the name Joe Carr; his technical articles and antenna topics have been respected for more than a generation by hams and SWLs.

Just out, the *Receiving Antenna Handbook* for designing and erecting home-brew antennas



is the best we have seen. It is absolutely loaded with authoritative construction hints for random wires, dipoles, multiband antennas, disguise antennas, verticals, loops, longwires, direction finding, arrays, loops and more.

Receiving Antenna Handbook, from HighText Publications (7128 Miramar Road, Suite 15-MT, San Diego, CA 92121), is \$19.95 plus \$2 shipping from Grove Enterprises; also available from other MT advertisers.

The Crystal Newsletter

A few months back, we mentioned a group dedicated to perpetuating the mystique of crystal sets, those simple broadcast receivers of yesteryear that derived their operating power from the energy of the received signals—no batteries required!

It would appear that the mystique persists; two illustrated volumes of the society's newsletters are now available at a cost of \$9.95 each plus \$2 shipping, each volume containing one year's worth of newsletters.

Topics include theory of operation, building plans, history of old crystal radios, operating hints, and related age-old techniques of early radio.

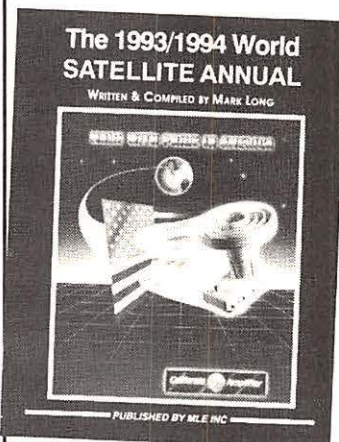
Write the Xtal Set Society, 789 North 1500 Road, Lawrence, KS 66049-9194, and mention MT.

Satellite Annual

Mark Long's '93/94 *World Satellite Annual* is an excellent

compendium of broadcasting earth satellites which has come to be recognized as a leading informational resource, both for the consumer and the user.

Extensively illustrated, *Annual* evolves chapter by chapter, from an introduction to direct broadcasting satellites and their technologies, through earth terminal descriptions and requirements, and on to extensive lists of satellites and their networks.



Annual's 400 pages present a superb tutorial, a course in brief on earth satellites. Details of earth satellites, their frequencies, users of the transponders, locations in orbit, footprints and more are listed for all regions.

If you are looking for one reference guide to broadcasting satellites, this one is worth the \$59.95 price tag (plus \$7 s/h in US/Can). For more details, contact Mark Long Enterprises, 150 N. Federal Highway, Suite 230, Ft. Lauderdale, FL 33301.

Industry News

In May, we featured the Tandy multimedia computer system as an easy but sophisticated introduction into the world of computers. Now comes surprising news that Tandy has sold its PC business to AST Research, who will continue to supply the Tandy (Radio Shack) stores.

It is unknown what effect this sale will have on the product, if any. It does increase AST's share of the PC computer market from 2.8% to 6.2%!

Reviews By Bob Grove

Millenium Rechargeable Battery Systems

Among progressive battery manufacturers, one name stands out: Gates Energy Products (soon to be a division of Eveready). Their Millenium Rechargeable Power System combines high capacity nicads (AA, C and D sizes) with fast charging.

The one-hour AA Rapidcharger comes packaged with four 700 mAH nicad AA cells and retails for \$24.99; the charger alone may be purchased separately for \$19.99 from Gates dealers.

The Millenium Charge Man scales the package down to one 3-5 hour charger and two AA cells; it sells for \$12.99.

Considering that most nicad recharging systems take at least 6-12 hours, the Gates system is certainly a quantum improvement. Even better, the Millenium cells carry a lifetime guarantee; when a battery finally gives up after 1000 or more charges, simply mail it back to the company for a free replacement!

Gates also offers a superbly composed, colorful guide to batteries called "Taking Charge." For your free copy and information on a dealer near you, call Gates toll-free at 800-CAN-POWER (226-7697).



Universal M-400 Decoder

Universal Electronics has begun delivering their new M-400 digital decoder, a handy accessory with built-in, two-line display for printing off-the-air texts of received RTTY, SITOR, FEC-A, SWED-ARQ, even FAX pictures when used with an accessory printer.

The display is a two-line LCD, 20 characters (5/7 dot matrix) per line. A low pass filter at 1275 Hz mark frequency permits shifts of 170, 425, 850 Hz and variable 100-1000 Hz.

Additionally, the M-400 is capable of displaying CTCSS (PL) subaudible tones, PCS (DPL) squelch tones, POCSAG and GOLAY digital paging messages, DTMF ("TouchTone") and air-to-ground ACARS signals.

What modes are missing? Morse code and packet are ignored in this model because, according to the manufacturer, of the increased cost of including them.

The unit is connected to the audio output (external speaker or headphone jack) of a receiver or scanner, or directly to the discriminator output of a suitably-equipped communications receiver. Power required is either 12 VDC or 120 VAC. Printer output is 8 bit ASCII to a standard Centronics DB25 connector.

Only 8-3/4" wide, the compact unit fits easily on the operating desk.

The Universal M-400 decoder is \$399.95 plus \$7 shipping from Grove Enterprises and other MT advertisers.



Grove Military Aero Scanverter

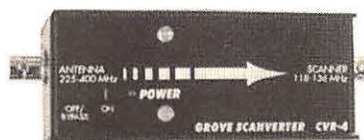
Years ago, Grove Enterprises developed a clever little converter which allowed scanner enthusiasts with 118-136 MHz civilian aircraft coverage to be able to monitor the entire 225-400 MHz military aircraft band by "bandstacking," breaking the wider UHF spectrum into smaller ranges which are "stacked" in the smaller VHF spectrum span.

Now Grove has fully upgraded the product using surface mount devices, resulting in improved sensitivity and stability, and has released it as the model CVR4 Scanverter.

The unit we tested had an average sensitivity of about 1 microvolt, quite adequate for monitoring military aircraft many miles away when used with any 118-136 MHz range scanner. It connects between the antenna line and rear-panel scanner connector. A switch allows the unit to be bypassed for normal reception without having to physically remove it from the line.

Although the scanner display still shows its original VHF frequencies while UHF is being monitored, a convenient look-up table makes mental conversion a snap.

The Grove CVR-4 Scanverter is \$89.95 plus \$4.50 UPS shipping.



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installed. A belt clip is attached for wearing convenience. It is available from Radio Shack outlets.

MFJ-1864 Base Scanner Antenna

Designed for low and high band scanner reception, MFJ's new model 1864 base antenna contains an integral 20 dB preamplifier and matching network for its 93 inch (tip to tip) elements.

The whip sections act as collinear 5/8 wave elements at 151 MHz for operation between 108 and 174 MHz, and as a short dipole on the 30-50 MHz band (60 MHz resonance).

The anodized-aluminum-rod whip sections are secured to the boom by porcelain standoff insulators; the boom itself is configured from anodized aluminum channel and contains the preamplifier. A U-bolt assembly is provided to secure the antenna to a mastpipe.

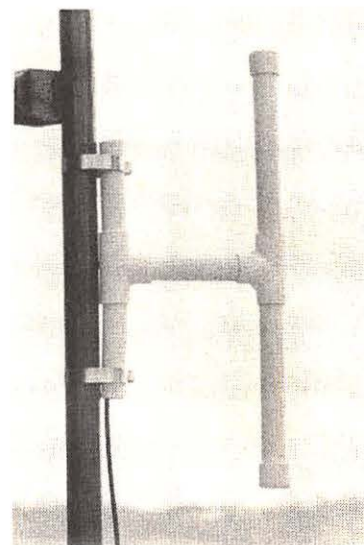
An SO-239 female coax connector allows any length of transmission line (not supplied) to run to the signal decoupler which receives 12 VDC from an AC wall adaptor (supplied) in the radio room. The user must also supply the appropriate cable to run from the decoupler to his scanner.

In our listening test, we confirmed the MFJ's specified 174 MHz upper frequency limit; reception at UHF and 800 MHz was virtually non-existent. We also tested downward from 174 through 27 MHz CB with excellent reception (but it can't be used for transmitting!).

The temptation to try the 1864 on shortwave was irresistible; we attached it to a Drake R8, then discovered why it isn't advertised for that frequency range as well; its performance cuts off dramatically on shortwave.

The antenna's integral preamplifier provides gain over a passive scanner antenna, but the system shouldn't be used in a dense metropolitan area or within a few miles of a TV, FM broadcast or other high powered transmitter, or intermodulation interference can be expected.

The MFJ-1864 Base Scanner Antenna is \$79.95 plus \$7 shipping from MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762.



Electron Processing Scanner Antenna

The new H-TENNA-SCN base scanner antenna from Electron Processing, Inc. is rated for 25-1300 MHz receive applications; gain is advertised as unity to 2 dB from its 36 inch center-fed element.

The H-TENNA-SCN is configured entirely of PVC pipe, and utilizes a pair of hose clamps for affixing the antenna to a mast. Inside the PVC pipes is a cluster of wire dipoles for the different frequency bands. A helical element is used for 30-50 MHz low band to approach resonance.

Approximately four feet of RG-58/U coax cable, terminated with a female BNC connector, is supplied to interconnect with the user's main coax line.

We tested it for reception against the Grove ANT-7 Scantenna and found that high band, UHF and 800 MHz reception was about equal, but the H-TENNA-SCN was poorer on low band (30-50 MHz) due to its shorter element length.

The H-TENNA-SCN Scanner Antenna is \$55 plus shipping from Electron Processing, Inc., P.O. Box 68, Cedar, MI 49621.

MT

Looking for all the world like the leading PRO-43 handheld scanner, the new PRO-44 is actually a low cost, scaled-down version for those who aren't interested in military aircraft or 800 MHz reception.

With a receiving range of 30-54, 108-174 and 380-512 MHz and a memory capacity of 50 channels, the PRO-44 is quite conventional. Scan and search speed is 16 steps per second, sensitivity is 1 microvolt FM, 2 microvolts AM; circuitry is dual conversion with IFs of 10.7 MHz and 455 kHz.

Spurious signal rejection through 174 MHz is 50 dB (unspecified at UHF); selectivity at -6/-50 dB is 20/40 kHz. Audio power is 200 milliwatts to the internal 1-3/8" speaker; a 1/8" (3.5 mm) earphone jack is included.

Individual channels may be temporarily locked out to speed up the scanning sequence, and may be selected for rescan delay as well, waiting two seconds for replies before resuming the scan or search function.

A signal uncovered during the search routine may be monitored, or may be committed to memory by simple keystrokes. A key lock prevents accidental bumping and disturbing of any settings.

Frequencies and functions are registered on a backlit LCD.

The scanner is powered by six alkaline or rechargeable nicad cells (not supplied); a side jack allows the nicads to be charged from a source of 12 volts DC, such as an automotive cigarette lighter cord or AC wall adaptor, either of which can also operate the scanner from a separate jack.

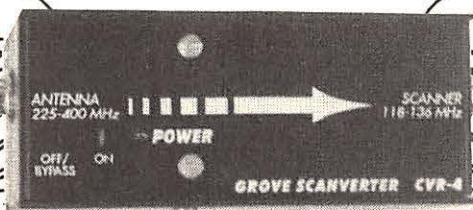
A clever battery saving feature automatically slows the search or scan sequence if a signal has not been heard for five seconds, resulting in a 70 percent reduction in battery power.

The PRO-44 measures 5-3/4"H x 2-3/8"W x 1-5/8"D and weighs 14 ounces with batteries

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The all-new Grove CVR-4 Scanverter uses a proprietary technique called "bandstacking" to reduce the 175-MHz-wide military aircraft band into an 18 MHz swath to be heard on any scanner with standard aircraft reception.

Assembled with surface mount devices and all-metal case, the CVR-4 offers excellent sensitivity (1 microvolt nom.) and out-of-band interference rejection. The on/off switch bypass function allows the unit to be left in line when not in use.

The CVR-4 Scanverter comes with a universal adaptor kit so that it can be connected directly to a hand-held scanner for portability, or to the rear of a base or mobile scanner (BNC and Motorola adaptors included).

Operates from standard 9-volt alkaline battery (not included).

ORDER CVR4

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SPECIFICATIONS

Frequency Range: 216-406 MHz

Sensitivity: 1 microvolt

Oscillator Frequency: 18 MHz harmonics

Power Required: Alkaline battery; 9 volt @ 13 mA

Connectors: BNC

Dimensions: 4"H x 1-1/2"W x 2"D

Weight: 6 oz.

Bypass Loss: 2 dB @ 400 MHz, 6 dB @ 800 MHz



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•Grundig's Yacht Boy 400—A Real Winner!

•Quick Peek at the World Access/Electrola Tabletop

For decades, Grundig made pleasant-sounding, but otherwise uninspiring, shortwave radios. Lately, under the prodding of its ambitious North American office, it has been concentrating on making better models. Still, Grundig's Yacht Boy series has continued to come up a day late and a dollar short. So when Grundig asked if we wanted to look at a just-as-we-go-into-production sample, we agreed more as a matter of course than with enthusiasm. Another plain-vanilla portable to review?

Wait Until October

Forget it! Grundig has leapfrogged the competition with its forthcoming compact portable, the Yacht Boy 400, due to appear for \$249.95 (CAN\$299.95) on dealers' shelves this October. We will, as usual, retest a "real-life" unit when it appears on the market to ensure that what we've found this time conforms to what's actually being sold.

Generally Excellent Tuning Options

The '400 covers the usual longwave and AM (to 1710 kHz) bands, FM in stereo through headphones, and shortwave continuously from 1711-30000 kHz. Shortwave tunes in 1 or 5 kHz increments by single-speed up/down slewing buttons. There's also tuning by "signal-seek" scanning, which works unusually well; meter-band selection, handy for bandscanning; 40 presets to call up favorite stations or for instant checks of parallel frequencies; and direct-frequency entry via keypad. Not only can each preset channel be accessed directly, but also there is a second set of up/down slewing buttons to allow you to "thumb through" the full bank of memory channels.

The bad news is that absent altogether is a tuning knob, the only real drawback in this otherwise well-thought-out configuration. The keypad itself is very nearly a model of performance. Its software for storing data and user operation is well thought out to keep confusion and keystrokes pretty much to a minimum. "Feel" and the spacing of keys likewise is excellent.

Yet, it is not flawless. The zero button is under the "7", rather than the "8" as is standard on telephone keypads. Too, the enter ("FREQ/METER") button is identical in size, color and shape to the other keypad buttons. On computer keyboards, and such other world band receivers as the Sony ICF-2003, an oversized key is used for the enter function.



Unusually Helpful LCD

The LCD provides a variety of information without being confusing, as it can be on some of the newer digital models from other manufacturers. There's the frequency display, of course—in kilohertz for shortwave, preferable to the megahertz used on some other models. The radio features a dual-zone 24-hour clock, as well, with the desired zone chosen by pressing a button. The clock is displayed even when the radio is on; with a number of other models, the clock only displays when the radio is off. Additionally, the '400's clock shows the seconds numerically when the radio is off, another of the many thoughtful small touches on this model.

If you listen to world band outdoors or in dimly-lit rooms, you know the value of having an illuminated display. The '400's LCD is nicely illuminated, extinguishing automatically after 10 seconds. You can also switch it off earlier than that by pressing the light button once again to reduce battery drain.

If the batteries are low, "BATTERY CHECK" is displayed. This could be more sophisticated, but it sure beats having your set suddenly go silent, as some of the newer Japanese models do, when battery strength ebbs! The signal-strength indicator, although it has 20 bars, actually operates in only five steps, corresponding to the usual five-level SIO reporting code. Compare this to the silly LED "glow light" found to indicate signal strength on so many other portables!

Microprocessor Can Be Reset

Microprocessors are wonderful devices. Yet, every now and then they can "hang up," causing strange results. The '400, virtually alone among world band radios, has a control to reset the microprocessor to the original default positions, in so doing clearing up such problems. Of course, it means the presets and clocks need to be re-

loaded with data, but that's a darned sight better than sending the radio out for service or trying to fix it yourself.

Shortcomings? The 24-hour time display lacks leading zeroes (04:00 shows as 4:00, for example), and there is no station-name display for the presets. Too, the volume control turns the opposite way from what most of us are used to.

Power is via six "AA" cells, which need replacement less often than if only the usual four or so were used. Thankfully, changing batteries does not cause the presets/time memories to erase, provided you don't take too long. The radio doesn't come with an AC adapter, but has provisions for one to be used.

Single-sideband lacks an LSB/USB switch. To tune upper or lower sideband more or less separately, you tune the radio down (or up) frequency 1 kHz, then adjust the fine-tuning potentiometer for zero beat. That pot, by the way, has a center detent, which is a real convenience. It also allows you to zero beat exactly, not to the nearest 100 Hz as on most other premium portables, including the costlier Sony ICF-2010 and much-costlier ICF-SW77.

Worthy Selectivity, Dual Bandwidths

Good selectivity is right up there among the most important attributes of a worthy shortwave receiver. Yet, most models manage to screw it up with only one bandwidth, poorly chosen bandwidth(s), mediocre bandwidth filters, or a combination of these vices. Not so the '400. For single-sideband reception, as well as for over-coming serious adjacent-channel interference when listening to world band stations, there's a narrow bandwidth to complement the wider bandwidth. Both bandwidths are very well chosen, a vast improvement over such models as the \$600 Yaesu FRG-100 we reviewed earlier this year.

In other respects, performance is generally top-drawer. Sensitivity to weak signals is quite good, especially for a radio of this size. If you're into DXing, or listen from the central or western portions of North America, you will really appreciate this.

Image rejection is more than adequate as well, although there is the occasional "birdie," and, depending on your local FM situation, there may be breakthrough of FM signals distorting within the shortwave spectrum. Chuffing is relatively slight with carefully timed muting so—with the 1 kHz tuning step—shortwave bandscanning works quite well.

The only real deficiency is the lack of synchronous detection, such as the first-class system

found on the Sony ICF-2010 and ICF-SW77. Fastidious listeners will miss this feature in which the ad slogan, "Sony, the one and only," takes on unusual meaning.

Superior FM and Audio Quality

The '400's FM is no slouch, either. It has a superior capture ratio, worthy adjacent-channel rejection and an almost complete absence of "flyback"—the tendency to hear a station appear not only on its proper frequency, but also at reduced level on one or both sides of that frequency.

All too often a shortwave portable that performs well sounds mediocre because of pedestrian audio quality. Here, even though there is only a simple high-low tone control, Grundig has lived up to its reputation for audio quality. It's not true high fidelity, yet, the '400 produces, without question, the best-sounding audio we have come across in a compact portable. Place the tone control on low for FM, high for everything else, and give your ears a treat!

For travel, there are a power lock and timer/sleep facilities.

Overall: Best of the Compacts

In all, the Grundig Yacht Boy 400 is the best compact shortwave portable we have tested. Hopefully, this is a sign of exciting things to come.

USA-Made Tabletop Model Debuts

Few developments have stirred the interest of *MT* readers more than the recently introduced World Access Radio 8A, also sold as the American Electrola DX-100. We've had the original version for some time, now, but, as mentioned last month, haven't given it a full review because it is to be superseded by a new, improved version.

That version is to appear shortly; in the interim here are highlights from our fiddling about with the original version.

"USA 1" Displayed on Screen

This radio makes no bones about where it is made, which is hardly surprising. The populist program "For The People," heard on such stations as WHRI, was being accused of hypocrisy for advocating the purchase of domestic products while at the same time selling radios made in the People's Republic of China.

"For The People" still sells Chinese radios, but last year they asked an American firm, the EDSI Co. (Quality U.S. Technologies) of Pittsburgh, to design and manufacture a shortwave radio made in the United States with as many U.S.-made components as possible. This is the result.

Plug it in, and the digital display boasts "USA 1" in bright, flag-red LED characters. Pick up the operating manual, and you'll find the covers and leading pages detailing the firm's quest to produce a truly American product. That's not all that is unusual. Unlike most shortwave models, it is shaped like a shoe box and is finished in oak-like Formica. From a distance, you'd swear it was a 1960's KLH FM radio.

Controlled via Membrane Keypad

Closer up, its more recent technology shows. Yes, there's a volume control and, yes, a genuine tuning knob. Otherwise, though, the radio is digitally controlled by a membrane keypad, such as is found on microwave ovens. Not only does it tune FM and shortwave, but also AM and longwave, the last presumably for Americans moving abroad where longwave broadcasts are audible. Tuning longwave is a bit unusual in that there are AM, FM and SW buttons, but no longwave button. The solution is that you push the SW position to get longwave.

The operating system otherwise is straightforward, and those large, bright LEDs are a pleasure to read. The membrane keypad is not a total success, however, since you usually have to hold the radio with one hand to keep it from sliding about, due to the pressure required.

Outstanding Sensitivity, but...

Performance is a decidedly mixed bag. On one hand, sensitivity to weak signals is simply outstanding with the built-in telescopic antenna. Indeed, the owner's manual warns you not to add a "longwire antenna" to prevent overloading, and we would second that advice. This model obviously has been designed to be sold in the Americas, where signal strengths tend to be moderate-to-weak, and not those overseas markets where a set with this level of sensitivity might not be able to handle the stronger signal loads properly.

Audio quality is okay, but far from what you might expect from a KLH look-alike. On the other hand, what you do hear is awash with unwanted sounds. To begin with, adjacent-channel rejection (selectivity) is dreadful, with stations two channels away sometimes being audible! As if this weren't enough, the synthesizer is apparently the chief culprit that produces a wide range of hissing and odd groans and squeals. So while lots of stations can be picked up, the quality of what is received is grossly substandard.

Try, Try Again

EDSI is right to give it another go in the lab. The original version of this radio, which sells for \$259.95 plus shipping, is far from being what it should and could be. Their first time up at bat produced a pop fly. Let's see what they can do next time up.

MT

ASA

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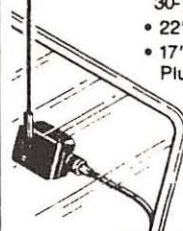
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Radio ROMing

My habit is to give my family first "swing" at each column I write before Editress Baughn or *MT* readers "chew" on it. Well, this month I was given a unanimous thumbs down on my first submission from the household. "Too sterile!" "Not enough life." "Missing something." As a famous comic says, "I get no respect!"

Re-reading it, I felt they were correct; but I just couldn't put my finger on the problem. Finally, after glancing at the column name, on came the light bulb. Computers and Radio. Radio and Computers. The title was a good one for the column, but it lacked a key element: people—the readers, the users, the software publishers and, God love them, the programmers.

The readers are always foremost in my mind when writing the column. A fair, sometimes critical assessment of the value of a program to the readers is the column's goal. I've seen the technocratic approach which tries to intimidate and exclude all but a select clique with technical code words. That's not this author's style.

The programmers are a constant source of, shall we say, interest. They range from former Titanic ship captains/turned programmers who know it all and have the perfect product which defies user inputs, experience or improvement; to the talented individuals with a great idea who are ready to listen to anyone to improve it. The first type of individual usually suffers from an acute case of lack of reality, painful for all concerned. The second, which I am happy to say I have spoken to many times while here at *MT*, is a pleasure to communicate with and is eager for improvements and feedback. So, with this rededication to breathing life into the subject, let's get going with the continuing saga of the CD-ROM and the monitor.

When we left our author last month, he was just spinning down a CD-ROM, holding his head at the *incredible* amount of programs that it contained and about to try out a CD from AmSoft; "World of Ham Radio Shareware, Volume 2" (WHRS, for short). At \$79.95 plus shipping, WHRS is expensive compared to the Chestnut CD reviewed last month. Is it worth it? Are all the three separate massive directories full of operating programs of interest to *MT* readers?

A phone call to Pete de Volpi, owner of AmSoft, is where we start our journey to answer these questions. Pete's the kind of guy I remember learning Ham Radio/Electronics from when I was in my early teens: knowledgeable, helpful, a sense of humor and never demeaning in word or manner to questions (even critical ones!). A real pleasure to talk to.

WHRS Vol.2 evolved from AmSoft's prior efforts on floppy disks. The 8,000 shareware files

(that's no mistake) represent a Herculean collecting job by Pete over the years. The cost of buying all these shareware programs on floppy disk would exceed \$800 and would take about 250 disks!

Let me tell you, as far as shareware programs are concerned, it's all here. For any of you who read the ads in *Computer Shopper Magazine* you'll recognize radio titles such as: YAPP, TOTAL HAM, TRACKSAT, PROCAT, BANDAID, GREYLINE, MINIMUF and SUPERMORSE, to name a very few. We spoke about some of these programs in a previous column devoted to shareware. I've tried these and they work well, but keep in mind *all* the programs are shareware, manufacturing demos or public domain.

That means, don't expect to find programs like SCANCAT or AEAFAX on the CD. There are some commercial program titles such as SEEKER-PC—a program widely advertised—but upon closer inspection you'll find these commercial titles are partially-functioning demos of the program. They

CROSS REFERENCE INDEX GUIDE

232	438 454 473 478 494 522 527 571 592	LOOP	407 536 572
	592 608 614 36	MAIL	474 476 522 592 593 615 ONE 35 36 46
ADVANCED	485 510 52		47 50 58
AEA	460 475 522 571 ONE	MFJ	475 512 571 604
AMTOR	477 592 604 ONE 57 58 61	MODS	465 43 51 58
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ANTENNA	416 493 508 572 40 41 53 58		560 ONE 57 62
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BAUDOT	401 522 ONE	NET	401 411 415 417 421 440 475 500 501
BEARING	424 552 576 616 ONE		507 550 35 37 38 56 62
BOARD	453 457 547 39 55	NOS	35 37 56 60
CALC	401 407 428 459 482 507 508 515 530	NOVICE	413 444 508 541 551 606 ONE 52
	536 537 ONE 38 39 40 41 53 58 62	PACKET	417 425 436 440 458 460 470 478 494
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	494 514 525 527 534 538 545 557 565	PROTOCOL	411 417 430 39 60
	571 585 594 ONE 47	QSL	407 424 445 517 523 548 608 ONE 42
COUNTIES	402 445 489 543 ONE 52		52 60
CW	401 427 461 462 477 520 528 560 604	QUAD	508 572 40
	ONE 57 61 62	RF	414 415 428 495 530 561 38 39 41 44 45
DESIGN	415 416 453 457 493 495 496 498 500		46 50
	505 508 529 561 572 573 577 579 580	ROUTE	453 457 39 55
	38 39 40 50 53 55 59 61	RTTY	401 408 454 459 477 494 497 522 528
DIPOLE	402 508 572 40		604 ONE 61
DX	403 445 470 518 520 543 552 566 576	SAT	401 419 465 480 487 497 515 549 591
	607 ONE 36 40 41 42 52 58 59 61		613 ONE 36 48 57 58 59 61
ELECTRON	426 428 466 482 500-507 580 ONE 38	SCHEMATIC	466 498 533 564 39 50 61 62
	52 53 55 62	SHUTTLE	419 420 465 603 ONE
ENGINEER	501-507560 38 39 43 44	SSTV	401 513 604 48
EXAM	413 423 427 443 444 461 485 492 541	SWL	409 429 488 538 586 587 597 610 ONE
	551 567 ONE 52 59 61 62		48 52 53 58 59 62
EXTRA	508 511 551 606 52	TCP	501 553 554 35 37 38 56
FAX	436 475 512 604 614	TECH	423 444 541 542 52 61
FCC	531 ONE 52 62	TNC	411 417 433 440 458 476 479 544 588
FILTER	415 503 505 38 50 61		590 604 ONE 35 37 43 47 60
FORMULA	414 426 ONE 38 41 50 55	TUTOR	413 423 425 439 442 485 532 541 606
G3CZC	437 467 487 492 598 602		ONE 40 59
GENERAL	509 52	UHF	422 432
GRID	518 566 40	VEC	427 443
HF	404 422 557 ONE 62	VERTICAL	508 530 572
KAM	475 477 528 590 61	VHF	407 422 432 459 497 518
KENWOOD	438 445 472 473 484 494 539 585 595	WEATHER	481 ONE 62
	ONE 43	WIRE	493 537 40 58
LOG	424 432 437 438 445 450 452 464 467	YAESU	471 483 484 525 538 545 ONE 47
	470 483 489 490 514 520 548 552 570	YAGI	407 459 497 508 529 40 41 53 59
	589 599 607 608 ONE 36 37 41 42 49	YAPP	411
	50 53 57 58 59 61		

Figure 1

are still quite interesting, since the demo lets you see what the program can do without purchasing the full commercial program. There are a few exceptions such as the ubiquitous RAC Frequency Catalog. This is a fully-functioning version of this frequency database program as it appears in shareware.

After speaking with Pete, I tried the CD myself. The method of copying or unzipping files from the CD to disk could use some help since I've seen more user friendly ones. But after overcoming this minor factor, I was stuck to my computer every night for over a week just trying programs. After tapping my phone and hiring a private investigator, my wife gave up on the idea of another woman, and the term CD-ROM took on negative connotations in the household.

To show you the enormity of the task of reviewing AmSoft's WHRS Vol.2, see Figure 1, which is a page out of AmSoft's Catalog showing where certain topics are contained on the CD-

ROM. The numbers to the right of the topic refer to whole floppy disks (not just a single file!) where program(s)/files on that topic can be found. Where the word ONE appears, it refers to a directory of programs first released in a nine disk set and now on the WHRS Vol.2.

For example, looking up "SWL," we find fourteen disks which contain SWL programs and/or files and disk set one, which has over 25 additional SWL files or programs. I estimate that this represents a total of 100+ SWL frequency files, equipment information, scanner and SWL databases and the like. There are some duplicate files with different titles and a number of revisions of the same file/program. I estimate that over 50% of the total will be of interest to most SWL and scanner monitors.

But take a look at the topic called CAT. That's right. Computer Aided Tuning. (See previous Computers & Radio columns for details on this type of program.) Nineteen more disks are referenced under CAT. But don't stop now. How about the topics LOG, RTTY, MUF, FAX, CONTROL, MORSE and many more? They all contain information files and/or programs which many monitors will find useful. Again, the usefulness ratio (in my opinion) was over 50%.

A number of data files have Shortwave Station Frequency and Time data that are years out of date. This will always be a problem when the "freshness" of the information has a shorter lifetime than the time it takes to produce the product.

Pete's approach in putting this CD together is to give Radio people all that they need. In this spirit, very useful programs for calculating antenna dimensions, circuit design parameters and commonly used electronic formulas are included. Parts catalogs from major semiconductor companies like Motorola and National Semiconductor are also referenced. The Motorola Program lets you select a device by either the part number or by entering the characteristics of the function you need performed.

The EXAM topic has lots of useful files/programs which will help you get a ham license or upgrade.

What could be added to a ROM that has everything?!

(Everything in shareware, that is.) Well, as I said at the beginning, having all this hundreds of thousands of man years of programming effort on a single CD-ROM is awe inspiring. But getting to it is another matter. I would love to see a relational database added as a major feature so that the user could input a topic, key word or name and would be prompted directly into the matching directories and files/programs. Accessing the data becomes ever more important as the volume of data increases.

I would also suggest a culling of programs so that only the latest version is included. This is not a major factor, but some duplications were found while I was doing random "looking." There are a few, very few (I found only two) titles that exist in the written material but do not exist as programs on the CD ROM. This is to be expected as a consequence of the volume of the program, but should be corrected in Vol.3, if/when it is released.

Finally, copying the zipped files, which are compressed to get much more data on the disk/CD and must be decompressed before they can be used, need a more automated transfer program to save the user time and effort. There are some utility programs on the CD which may contain these copy/decompress programs but they are not clearly identified.

Conclusion

Do you like shareware programs? If so, this is a must have piece of software. Is it worth \$79.75? I think so, without question, when you consider where it can lead you. How does it fit with Chestnut's \$20HAMCDROM reviewed last month? (*Wow—you readers are really asking hard questions.*) To get a taste of HAM ShareWare and CD ROM the Chestnut CD is excellent. But, to get fully immersed in all aspects of electronics, ham radio, SWLing, equipment design, etc, AMSOFT's world of HAM RADIO SHARE WARE Vol. 2 is hard to beat.

With these two CDs, I believe you'll have enough radio-related/electronics files/programs to last you for a long time. Perhaps just as important is the opportunity they offer to explore different topics. They will lead you in to new and interesting areas in the field of electronics and devices. For some, these could be the beginning of new, or redirected, careers in electronics. For others it will be plain fun.

My thanks to Pete deVolpi for his genuine friendly approach to our hobby and a fine product. World of Ham Radio Shareware, Volume 2, is available from AMSOFT, PO Box 666, New Cumberland, PA 17070-666, for \$79.95 plus shipping. You can contact them on 717-938-8249 M-F 9-9 EST. Their catalog, which lists all the titles on the CD-ROM, is available for \$1.00 from the above address.

With CD-ROM drives starting at \$189 and CD ROMs as low as \$18, 1993 will go down in history as the year of the CD-ROM. The future will hold even lower prices, higher data densities and, eventually, writable CD-ROMs. Keep watching as the technology evolves. In the coming months we'll look at radio software which run in the Windows environment, and we'll answer some reader's letters. 'Til next month!

MT

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Low Cost Wooden Cabinets

Are you as dollar-weary as I am when it comes to buying metal cabinets for your home-made equipment? There seems to be no limit to the spiraling cost of commercially made boxes and cabinets. Also, it is not an easy task to find a metal cabinet that is just right for your new project. The entire exercise can be frustrating and costly to those of us who enjoy building radios and test gear. The solution to my problems with suitable cabinets is seen in this article. Perhaps you will be inspired to use wood for your next equipment enclosure.

Which Wood is Best?

Ordinary 1/4- or 3/8-inch plywood is entirely adequate for most projects we build. For the most part, we are not interested in creating a piece of furniture for the den. Rather, we are trying to simulate a metal cabinet using wood. Plywood is

relatively inexpensive if you buy the type that's finished on one side and rough on the other. The rough surfaces are kept inside the cabinet.

But, if you want your radio to be a woodworker's treasure, you can use quality stock such as cherry, black walnut or some other hardwood of your choice. If you are lucky enough to own a planer you can work the wood down to the desired thickness. For this article we will use plywood.

Construction Tips

Figure 1 shows the front panel of a typical wooden radio cabinet. Note that the opening for the speaker has three vertical protective bars that are part of the front panel. These may be formed with a saber saw or scroll saw. They help protect the speaker from external damage. Small speakers (3-4 inches) need not have this protection, so

a circular cutout should suffice. Most of my speakers are 6 or 8 inches in diameter and hence the bars.

The grill cloth is affixed to the rear of the front panel by means of staples and carpenter's glue. I buy burlap at variety stores and use it as grill cloth. It looks good and it's cheap.

The threaded collets of most volume controls are not long enough to allow you to catch the threads with a hex nut when using 3/8-inch wood stock. The detail drawing at A in Figure 1 shows my solution to the problem: The outside surface of the panel is undercut 1/4 inch with a 3/4-inch Forstner or brad-point bit. When the nut is affixed to the control collet it is nicely recessed into the panel. The knob covers the hole.

You will need to decide what type of panel opening you desire for the tuning dial, if one is used. I prefer the style shown at A in Figure 1. I make my own dial plates by drawing them four times scale and then having them reduced to scale with a copy machine. The imperfections in the printing and calibration marks tend to disappear with reduction. A thin piece of clear plastic is glued over the dial opening (on the inside of the cabinet) to provide a readout reference. I scratch the plastic with a sharp instrument to obtain the reference line. The groove is then filled with India ink. The outer edges of the clear plastic are roughed up with coarse sandpaper to help the plastic adhere to the wood when the epoxy glue is applied.

The border of the dial opening is painted a contrasting color, as shown, to simulate an escutcheon. I usually score the outer wood along the outline of the escutcheon (1/64 inch deep) to prevent the paint from migrating onto the rest of the panel. I use a tool made from a 1-1/2 inch piece of a hacksaw blade that has been sharpened at one end. I tap the indentation into the wood by tunking the cutter blade with a light hammer.

You may prefer to cut an escutcheon from brass or aluminum stock. If so, it can be glued to the outside of the panel. I have also used 1/8-inch-thick hard-wood for my escutcheons.

Securing the Speaker

I avoid boring holes through the panel when installing speakers. Keeping the bolts hidden helps impart a professional look. Figure 1B shows a technique that is applicable to wooden panels. I use 6/32 binder-head screws that are set into the back side of the panel. A 6/32 hex nut is used to prevent the screw from turning when the speaker mounting nuts are tightened. The hex nut and screw are imbedded in quick-setting epoxy glue.

The recessed area on the rear of the panel is undercut at its base as illustrated in the inset drawing. For this I use a motor tool and tiny router bit to taper the base of the hole outward 1/8 inch.

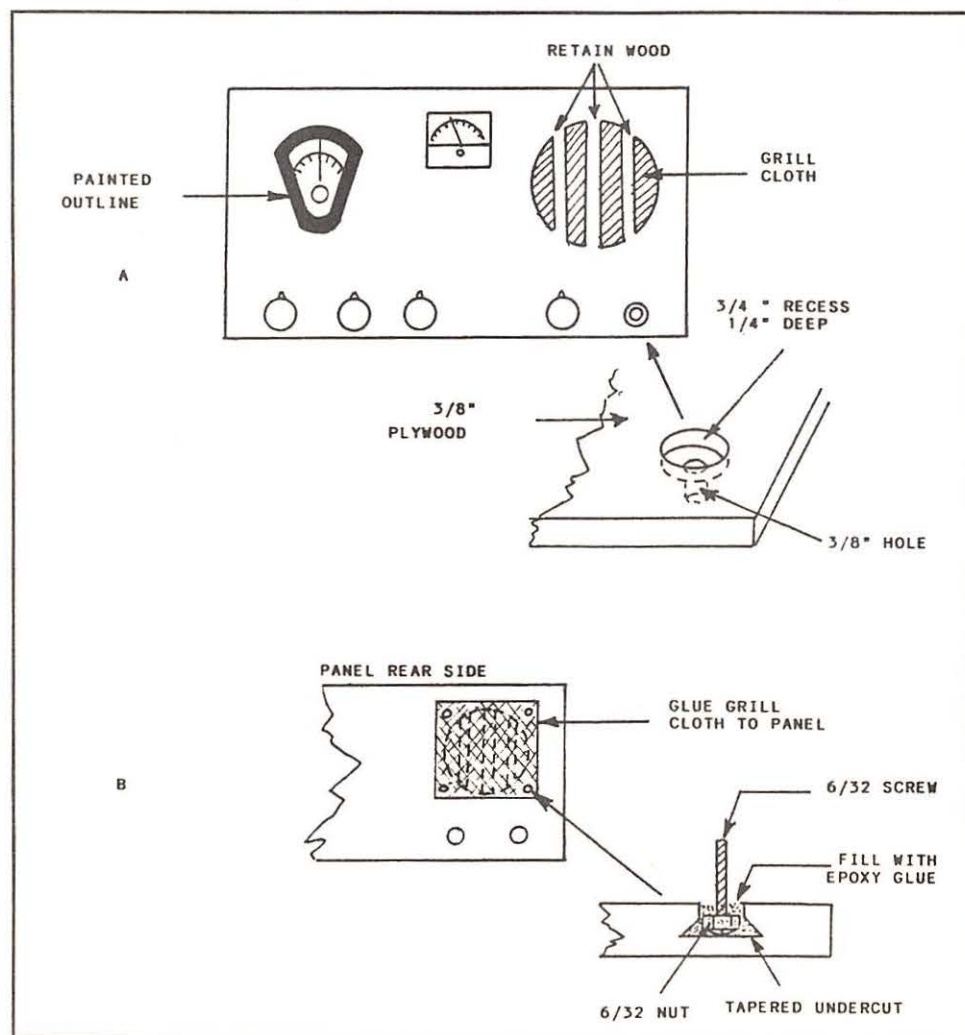


Figure 1: Pictorial drawing of an equipment panel made from plywood. Details for illustrations A and B are covered in the text.

This allows the epoxy glue to flow into the undercut section, and prevents the screw, nut and epoxy from pulling out of the panel. Do not attach the speaker until the glue has dried for 10-15 hours.

What About Shielding?

Some projects require a shielded cabinet. This can be accomplished easily by simply gluing thin hobby-shop copper or aluminum foil to the inner surfaces of the cabinet. I prefer the copper because the sides, top and bottom can then be soldered together to ensure a shield with electrical integrity.

Finishing the Cabinet

The first priority is to sand the plywood until it is smooth. If there are indentations and small cracks, you should fill them with a good grade of filler material before sanding the wood. I use ZAR brand, which is available at most lumber outlets.

Now comes the choice of paint color. This is a very personal thing with most builders. My choice for panels is usually light gray or an off-white paint such as eggshell. Labels will show up much better against a light panel. Dark gray is my choice for the cabinet. A coating of wood sealer is recommended before the paint is added. After it dries you should work it over lightly with steel wool to make certain the surface is smooth.

Some suggestions for labelling materials are press-on decals, stick-on labels produced by a labelling gun, or print on stiff, glossy paper. Choose a paper or labelling tape of a color that will blend in with the panel color. As done with the dial plate, photo-reduce your larger original onto the heavy paper for best copy.

It is prudent to apply a coating of spray polyurethane varnish to the cabinet and panel after the labels are in place. A good alternative coating is DEFT brand gloss or semigloss wood finish. The clear varnish protects the paint and labels from damage.

As an alternative to painting your cabinets and panels you may want to consider using contact paper of your choice. Various wood-grain papers are available. If this is your choice for finishing the cabinet, be sure to apply two coatings of polyurethane or other clear lacquer to the wood before adding the contact paper. This will ensure that the paper sticks firmly to the wood.

Final Remark

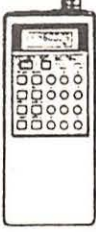
You need not be a skilled woodworker to make your own cabinets. With a little practice you can turn out a very commercial type of box for your project. I have made numerous wooden cabinets for test equipment, ham gear and home-made BC-band radios. I have saved countless dollars in the process. The raw materials are as close as your lumber yard!

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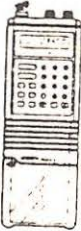
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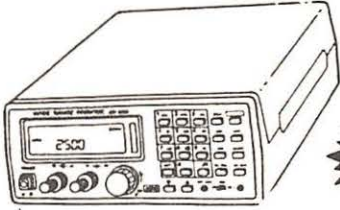


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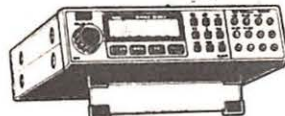
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How to Improve Receiver Selectivity — II

Last month, we dissected the subject of receiver selectivity. This month, we'll dispense with the head-tripping theory and just run amok through the receiver's innards in our quest for profoundly sharp selectivity.

Solution 1:

It is probable that most receivers can be improved by the hobbyist to yield sharper selectivity. In general, there are three approaches to this goal. This first approach is usually the easiest, but it requires some unusual parts: emitter bypass resonators.

The section of the receiver in which this approach should be focused is the last IF section, usually 455 kHz. This section of the receiver contains anywhere from two to a half dozen or more transistors which amplify the 455 kHz IF signal before it is sent to the Detector circuit. Resident within this section will be the predominant selectivity determining devices, the IF filter and possibly one or more tuned transformer "cans" (DON'T adjust them!) between each IF amplifier transistor. Refer to Figure 1 for a simplified diagram of a typical receiver's last IF section.

Now identify the amplifier transistor(s) for that section. On the emitter of each IF amplifier transistor will be one or two resistors to ground, and a capacitor at each resistor to ground. Let me submit that several dB of selectivity can be added by replacing those emitter bypass capacitors with "emitter bypass resonators." The short theory of this approach is that capacitors are non-selective at IF frequencies and allow the amplifiers to boost all signals by an equal amount. Emitter bypass resonators, on the other hand, allow full amplification ONLY of signals which are at the designed center frequency range (455 kHz). Off-center or adjacent signals are amplified less when emitter bypass resonators are used in place of capacitors.

To replace all emitter bypass capacitors in the last IF section, first be sure to identify and locate these components in your receiver. If you can access the bottom side of the circuit board where the capacitors are soldered, so much the better. Desolder and remove them. If the solder side of the circuit board is not readily accessible, it may be possible to carefully crush each capacitor in the middle of its body so as to preserve the leads. Then gently crush the residual capacitor material that clings to each lead until the stuff crumbles off, leaving exposed wires. Either way, solder an emitter bypass resonator to the points where each emitter bypass capacitor was removed.

This method of beefing up receiver selectivity is not highly technical and requires little more than the ability to identify and locate capacitors in

a specific circuit. A soldering pencil and a diagonal cutting pliers are among the most complicated tools that you'll need. It is advisable to have the service manual for your receiver before attempting this and any other serious modifications to avoid removing the wrong components.

Emitter bypass capacitors are usually (but not always) of the ceramic disk variety; two-leaded, thin disk shaped gizmos about 3/16" to 5/16" in diameter. The value is not critical and may range from 0.001 F to as high as 1.0 F; 0.1 F is common. See the sidebar in last month's article for sources of emitter bypass resonators, IF filters and other materials for selectivity enhancements. The Murata-Erie BF-455A is known to be an effective emitter bypass resonator.

Solution 2:

Probably the most dramatic improvement you can make to your receiver's selectivity is to add another filter in series with the stock filter. Depending on the receiver, there may already be switchable IF filters to offer selectivity settings of wide, medium and/or narrow. In this case, it makes little sense to improve the selectivity of the wide and/or medium filters, since selectivity is not always important when reception conditions are not adverse. It's when the receiver is already set to NARROW and you still can't dig out those weaker stations adjacent to the power blasters that you need the utmost in selectivity.

Therefore, if your receiver has two or more selectivity settings (not SSB and CW) then it's the narrowest section that you'll want to modify in this approach. If your receiver doesn't have selectable bandwidths, then you have no choice but to modify the one filter section.

Probably the easiest and still a very effective method is to install a 2nd IF filter in series with the existing one. The 2nd one need not be anything special and, in fact, can be salvaged from junked CB or ham rigs with little difficulty and virtually no cost. Most surplus and salvage IF filters are small, solid plastic, boxy devices about 5/16" L x 1/4" W x 5/16" H, with three to five wire leads on the bottom. See Figure 3 for pin diagrams of common IF filters. These low-cost IF filters are usually colored black, although I have seen white and blue, too.

The buzzword for this type of device is "ceramic IF filter," in case you need to ask around. Virtually every CB radio since the middle 1960's comes with one, and there must be a million junkers laying around from which you can salvage a ceramic IF filter. The part number that's stamped on the majority of these filters will be something like "CFU-455" with a letter suffix of I or H and sometimes, HT. Most are made by Murata.

One caution here is that none of these CFU-455(x) filters will be good enough to serve as a stand-alone replacement filter for the stock one. Use this type of filter only as a supplement to the stock IF filter. Here is how to install it:

Locate the stock IF filter. At both its INPUT and OUTPUT ports will be found a "coupling capacitor" of about 0.01 F. Remove one of those capacitors or carefully crush it to preserve its wire leads, and presto, there are your IN & OUT points at which to connect the new filter! It's generally best to install your new filter on the INPUT side of the stock filter, but if the OUT side is more convenient, feel free. The best approach here is to solder a short, fairly stiff wire to each of the two holes or leads where the coupling capacitor was removed. Solder the IN & OUT terminals of your new filter to these short stiff wires. Then solder a short wire from the filter's ground terminal to a nearby receiver ground spot.

This basically completes the job, except that you should install a new coupling capacitor between the new filter and the outermost of its two leads, IN or OUT. Where, depends on whether you installed your new filter on the IN side of the stock filter or the OUT side. The bottom line is that the new coupling capacitor (0.01 F will do) must go between the new filter and the receiver circuit. It is OK for the two filters to directly connect to each other (see Figure 2), but each filter needs to be isolated from the receiver circuitry by a coupling capacitor. The side of the stock filter that you did not modify will already have such a capacitor so you need only add one to the side you worked on.

An ideal place for the new capacitor will be between one of the leads of the new filter and the stiff wire leads that you installed at first. Figure 2 shows exactly what to do. Also note there will be a resistor on both sides of the stock IF filter. Make sure these resistors remain active in the circuit, or add a new one of the same value to the outer side of the new filter if need be.

This second approach is not perfect, because an additional IF filter will slightly reduce the IF-gain by an amount equal to the "insertion loss" of the new filter, typically 2-3 dB. This is generally of no significance and need not be cause for concern. The slight loss of gain is amply compensated by a higher signal-to-noise ratio and better selectivity. Still, it is a minor compromise.

Solution 3:

Possibly the best approach to enhancing your receiver's selectivity is to replace your receiver's so-so IF filter with a good one! Pop out the old filter and install a new one, lead for lead, never minding any excess ground leads that may have been on the old one. Even if the new filter's leads

don't match the old one, it is a simple matter to install 1/2"-3/4" stiff wires into the existing holes and then position them to mate with the terminals of the new filter. Lead length is not super critical at 455 kHz, but you do want to keep lengths as short as possible. See Figure 3 for the pinouts that will be encountered in most IF filters.

The trick here is to acquire a filter that's better than the one to be removed. The sources given in last month's article will be able to assist you in this selection. For those of you who aren't too keen on doing the necessary research, I heartily recommend Kiwa Electronics for their line of replacement high performance IF filters for many receivers. Give them a call at (800) 398-1146 or (509) 453-KIWA if you're not sure what's best for your rig. See Kiwa's ad in this issue, and last month's sidebar, for other IF filter resources available to you. You need no longer be stifled and frustrated with mediocre selectivity, even in bargain receivers!

Experimenter's Support Line

By the way, I am pleased to be able to provide technical support on this and many other electronic projects via The Hertzian Intercept BBS at (619) 578-9247 after 6pm and before 1pm, PDT, weekdays and 24 hrs on weekends. I am also available for chatting and discussing radio technology with you via the FidoNet SCANRADIO and SHORTWAVE conferences. Log on to any Fido affiliated BBS in the world that carries either of these two conferences to be in direct contact with me and thousands of other inspired radio hobbyists worldwide. If your favorite (local) FidoNet BBS does not presently carry these conferences, request your SysOp to bring them in. FidoNet is an amateur computer network of some 20,000 bulletin boards from Australia to Zambia and all points between.

If you've been reluctant to communicate with me by mail, (and with good reason; I can only correspond with just so many in a day's time), I recommend you connect to this network. I will be happy to mail you a list of Fido BBS's in your local calling area for an SASE or you can request a BBS list for your area via The Hertzian Intercept BBS, per above.

Computer networking with fellow hobbyists adds a new dimension to the excitement of otherwise passive radio monitoring. It's similar to being a ham or a CB'er where you get to TALK to others in addition to listening to them. The combination of Computers and Radio is not going to be licked, so it may as well be joined. After all, communications is what we're all about, eh?

MT

FIGURE 1: MODIFYING A RECEIVER'S LAST I.F.

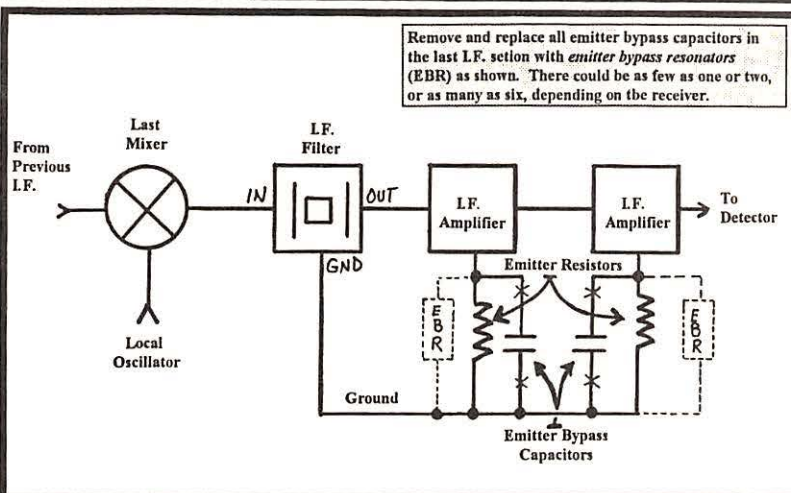


FIGURE 2: INSTALLING A SERIES I.F. FILTER

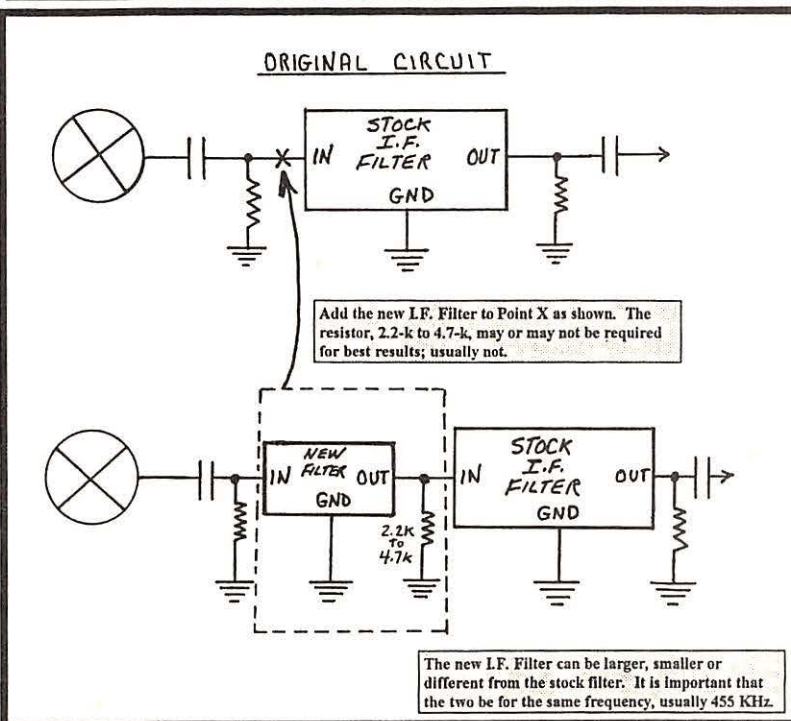
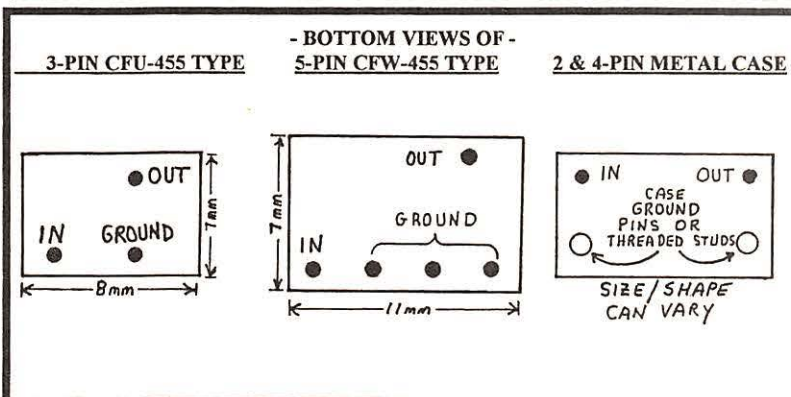


FIGURE 3: PINOUTS OF VARIOUS I.F. FILTERS



Standing Wave Ratio:

How Does it Affect Your Monitoring? How Can You Check It?

Standing wave ratio (SWR) is a condition resulting from the rejection of a portion of a radio signal away from the direction we want it to go. For instance, let's say that our antenna receives a signal and that we want this signal to enter the feedline and proceed toward the receiver so that we can listen to it.

Usually some portion of the signal is rejected at the antenna-feedline junction; instead of entering the feedline and moving toward the receiver this rejected portion will reflect back into the antenna and cause standing waves which will re-radiate some of the desired signal back into space! The more signal reflected back, the higher the undesired SWR. Also, a portion of the signal which does come down the feedline may be rejected at the receiver's input circuit; the more signal rejected, the higher the SWR on the feedline.

When do we need to be concerned about SWR?

The ideas just expressed would suggest that we should always strive to keep SWR values to a minimum. Let's see if this is the case.

In general, below about 30 MHz, received noise is sufficiently strong to compete with weak signals, even completely masking over the weaker ones. In this case the level of received noise as compared to the signal level creates what is called the "signal-to-noise ratio" or "S/N ratio." The S/N ratio determines the readability of a signal.

If we reduce SWR level on the signal path from antenna to receiver we increase the level of signal which reaches our receiver. But, unfortunately, this will also increase the received noise level which accompanies the signal just as much as it increases the signal level. Thus the S/N ratio stays the same and signals will be just as heavily masked by noise as before, with no gain in weak-signal readability.

On the other hand, as we move upward in frequency there is less received noise. At some frequency the received noise level is so low that it is no longer strong enough to dominate the S/N ratio. The S/N ratio is then more dependent on the noise which is generated in the receiver itself. At this and higher frequencies, it is possible to improve reception by reducing SWR level on the signal path between antenna and receiver.

How Do We Reduce SWR?

The SWR caused at a junction can be minimized by matching the impedance of the two

circuits joined. That is, at the antenna-feedline junction, if the antenna feed-point impedance is 50 ohms and the feedline impedance is 50 ohms, then there is a perfect match and SWR due to that junction is at a minimum. If the other end of the 50-ohm feedline is connected to a 50-ohm receiver input, then SWR due to that junction is at a minimum also.

Contemporary receivers almost invariably have antenna circuits of approximately 50-ohms impedance. Coincidentally, 50-ohm coaxial cable is something of a standard for feedline these days. Thus, there is acceptable matching at the receiver-feedline junction. On the other hand, the feedpoint of many common antennas is not close to 50 ohms.

When the antenna feedpoint impedance and feedline impedance are not similar, we may need to use some kind of matching device to prevent excessive SWR. Various devices, such as a balun, an antenna tuner, or short sections of transmission line properly connected are available to bring mismatched circuits into a matched condition.

And So...

If you are primarily monitoring frequencies below 30 MHz or so, you can probably forget about mismatches and SWR in your signal path. If you have enough signal level to hear the signal you want, simply increasing its level won't improve the S/N ratio and thus won't increase its readability. If you live in a location where received noise is extremely low, this may be true only up to 20 MHz or so. Whatever the case, as we move up in frequency, received noise will diminish, and for VHF, UHF and microwave, matching at junction points on the signal path is essential for optimum weak-signal reception.

Note that the above discussion is limited to receiving-antenna systems. If your antenna system is used for transmitting, it is important to consider SWR at the transmitter-feedline junction regardless of the operating frequency used. On the other hand, when there is low loss in the feedline, it is usually okay to ignore SWR due to mismatches at the antenna-feedline junction even in transmitting-antenna systems.

SWR Analyzers

The determination of SWR level requires a source of radio frequency signal and an SWR meter. Many monitoring stations have neither of these items. Fortunately, MFJ Enterprises has for some time now manufactured a line of SWR



Figure 1: MFJ-249 SWR Analyzer

analyzers which incorporate a radio frequency signal source and an automatic SWR meter in one unit. In their model MFJ-249 they have also incorporated a continuous tuning range of 1.8 to 170 MHz with a digital frequency readout. It is simply necessary to connect the analyzer to the antenna or antenna feedline, set the frequency at which you wish to measure SWR, and read the SWR for that junction! The advantage of such a unit is obvious to anyone who has used traditional SWR meters which require a separate RF source and multiple adjustments to measure SWR.

Note that in using the MFJ-249 it is assumed that you are trying to match a 50-ohm circuit, such as your receiver antenna-input, your transmitter antenna-output, etc. to an antenna or antenna system which is also 50 ohms impedance. The farther the antenna or antenna system is from 50-ohms, the higher the indicated SWR.

In addition to enabling you to measure SWR with remarkable ease, the '249 will help you find an antenna's resonant frequency or allow you to determine whether an antenna's elements should be lengthened or shortened to bring the antenna to resonance at a particular frequency. Certain uncommon antennas with feedpoint impedances far from 50-ohms, such as two halfwaves fed in phase at the center, will not yield meaningful resonant frequency measurements with this unit.

As a nice double bonus, the MFJ-249 also functions as a signal generator across its tuning range and as a 170 MHz frequency counter.

The MFJ-249 lists for \$199.95 plus shipping. The phone number for finding your nearest MFJ dealer or placing an order is 800-647-1800.

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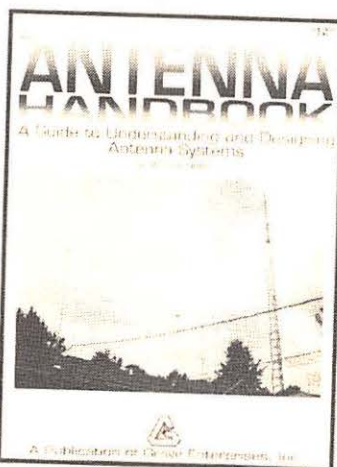
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Antenna Reference Source

Tired of looking through back issues of *MT* to find an answer to your antenna questions? If you'd like an inexpensive source of information, whether on selection, construction, or use and testing of antennas, you will be interested in my new book: *The Antenna Handbook*. Incorporating much material from past columns and a good deal of new material, this book provides an excellent source of help in designing and understanding your antenna system. Most types of antennas are represented as well as some you probably haven't thought of yet.

Also covered are subjects such as the history of antennas, odd and unusual antennas, signal propagation, factors affecting antenna performance, antenna accessories and antenna troubleshooting. *The Antenna Handbook* is available from Grove Enterprises (P.O. Box 98, 140 Dog Branch Road, Brasstown, NC, 28902) for \$12.95 plus \$2.00 book rate postage (\$4.50 UPS).



RADIO RIDDLES

Last Month

Last month I mentioned that some early attempts at wireless communication utilized audio-frequency signals sent and received by induction

rather than by RF signals radiated and received as radio waves. Then I asked if it were "possible that, even with modern radio equipment, at times we still communicate via inductive, or even capacitive coupling, rather than with radiated radio waves? And what is the *near field* and *far field* of an antenna anyhow?"

Well, radiated radio waves are that portion of a signal which is launched into space by a transmitting antenna. A portion of each half cycle of the signal in the RF field surrounding a transmitting antenna does not escape into space but collapses back into the antenna as each half cycle is finished. This portion is known as the "near field" of the signal. Only the portion of the field that is so far from the antenna that it is unable to collapse back into the antenna as the half cycle ends becomes a true radio signal. This is the "far field" of the signal.

If we are using a loop antenna to receive a signal and we are quite close to the transmitting antenna, it is likely we are receiving the station via near-field induction rather than by actual radiated radio waves; if we are using a short whip antenna rather than a loop, it is likely that we are receiving by capacitive coupling rather than by radio waves!

This Month

We've been talking about "standing waves," but to be simplistic, are they really standing like you and I stand? And if so, what do they stand on? Are there also "sitting waves," or perhaps some kind of waves that do something besides just standing around?

We'll have the answer to this month's riddle in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

MT

Q. I know that subsidiary carrier systems (SCS, formerly SCA) are often found 67 kHz above the center carrier frequencies of FM broadcast stations, and carry interesting non-broadcast programming. I hooked a shortwave receiver to the IF output of an FM radio and tuned 67 kHz away, but couldn't find any SCS signals; how come? (Tom Morganelli, Bethlehem, PA)

A. Because the SCS signal is actually part of the original wideband modulation and has to be detected first. An SCS decoder (in reality a simple AM receiver) is connected to the detector output of the FM radio, then tuned 67 kHz away from the center of the audio baseband.

Q. While searching through the scanner bands I recently came across an unreadable phone call on 895.860 MHz. I switched from FM to AM and it came in clear.

Permanent Backlight for the BC200 XLT—Part II

In our June issue, we mentioned a procedure to add a switch to allow prolonged activation of the display backlight on the popular Uniden BC200XLT. Readers Sly Kapchinski and Timothy Teer found that the procedure did not work properly.

Where our diagram refers to connections being made at A and B on the drawing, it should be A and C of that transistor. This works on the BC200XLT, BC205XLT and probably on the BC100XLT, as well.

Q. Could this be a Canadian cellular telephone? (Daniel Anderson, Bemus Point, NY)

A. You are hearing In Flight Phone, an AM aircraft radiotelephone service with 6 kHz channel spacings. You were monitoring an air-to-ground transmission from channel block 1, channel C-8 (895.858 MHz) or C-9 (895.864 MHz). Cellular telephone bases transmit between 869 and 894 MHz, so you are above that range.

Q. Are police agencies operating on frequencies within the cellular telephone band? I hear Fairfax County, Virginia, on 875.0375 and 875.6625 MHz. (Steve Marshall, Reston, VA)

A. You are hearing images from their FCC assigned frequencies 21.4 MHz lower. The only times that police agencies will be heard on cellular frequencies is when they are using cellular phones.

Q. My Uniden BC200XLT scanner is limited to go no higher than 956 MHz, but I know it can have some frequencies restored. Can I hear above 956 MHz? How about the 225-400 MHz military aircraft band? (Rodney Souza, Maui, HI)

A. No and no. The microprocessor sends commands to tell the rest of the circuitry what to do; the micro in the BC200XLT can go no higher than 956 MHz, and even if it could, you wouldn't hear anything worth listening to since 960-1215 MHz is assigned to aeronautical navigational data, not voice.

Similarly, the 225-400 MHz band was never programmed into the 200's micro chip, so there's nothing to restore.

Q. Can a VCR be connected to an antenna and used to record a portion of the radio spectrum, then attached to a radio receiver for playing back later as the radio is tuned through the recording to intercept signals in virtual "real time"? (Tom Morganelli, Bethlehem, PA)

A. Absolutely. NSA has been doing it for years; they call it "predetection recording." But they use much better recorders; a home VCR has a limited bandwidth (low megahertz) and narrow dynamic range, so your recorded spectrum would be limited in both width and signal strengths.

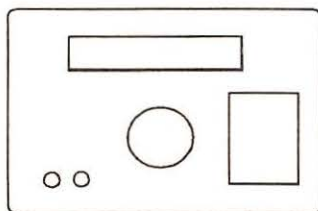
Q. When I switch on my home computer, reception from low frequencies right through UHF goes out the window. I would like to add a computer interface, but

Bob's Tip of the Month

An SWL's Slinky™

Hams have known for years that the Slinky™ toy makes a great, compact HF antenna. Simply stretch the metal coil as far as you have room for, and connect it to the radio's external antenna jack.

Robert A. Compton of Mertztown, Pennsylvania, reminds us that SWLs can benefit from the same frugal wisdom. The metal Slinky™ can accommodate any size room, any spacing between supports, and works better than a wire because its enclosed coiled area captures more signal and more closely matches the low impedance of the antenna jack.



Hang the contrivance vertically, or support it at both ends horizontally, whatever is convenient and gets the best reception. You can solder directly to one end of the spring toy, or simply attach a spring clip to the end of a length of coax or even a short wire lead to the radio. Most anything works!

know that would make things even worse. What can I do? (Frank N. Shumard, Springdale, AR; Edgar Cohen, Baltimore, MD; others)

A. Different computers generate different amounts of interference. Check the certification tag on the back and make sure it has an FCC ID number and a statement that it complies with Class B Part 15 requirements. If not, it is probably illegal and may well exceed the radiation limits.

Borrow a notebook computer; they often have lower radiation limits. Use only shielded interface cables. Wrap all cables around RFI chokes. Ground the cabinet of the computer, all peripherals and radio equipment together. Separate the computer from the receiver as far as practicable. Use an outside antenna located as far as possible from the equipment, and use only well-shielded coax transmission line.

If that doesn't work, do you enjoy stamp collecting?

Q. I hear our local fast food restaurants on itinerant frequencies 154.570 and 154.600 MHz; aren't these frequencies reserved for short-termed business use like road and building construction? (Daniel Anderson, Bemus Point, NY)

A. Although commonly called itinerant, those two frequencies are not; they are low power industrial and are used appropriately.

Q. How can I use an outside antenna to improve medium wave AM broadcast reception? (David Galloway, Lexington, SC)

A. Locate the antenna as far as possible — and at right angles if you can — from power lines; use coaxial cable from the antenna to the radio; select a receiver with a good noise limiter or blanker; a second antenna running in another direction may be advantageous.

Some AM DXers choose an indoor loop which they can turn to null out interference from other broadcasters as well as electrical appliances and wiring.

Ken Cornell's *Radio Frequency Scrapbook* (\$17.50 postpaid from the author, 225 Baltimore Ave., Point Pleasant Beach, NJ 08742) is the standard reference for such experimenters and listeners.

M

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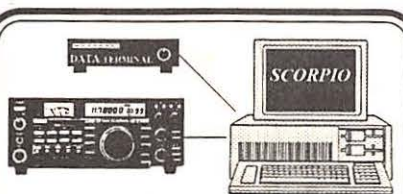
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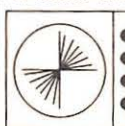
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Club Circuit

Welcome to ...

British DX Club (BDXC)

This major UK-based club was founded in 1974 as the Twickenham DX Club, though it now has many international members as well. The club's focus is on all aspects of DXing, including shortwave, mediumwave, and VHF/FM bands. Pirate and clandestine radio and satellite-delivered broadcasting are also addressed. No mention is made in their promotional material of utility coverage.

The British DX Club publishes an impressive 40-page monthly booklet entitled *Communication*, as well as an annual directory of British radio stations. A sample copy of *Communication* is available for return postage (3 IRCs or \$2 US-cash).

Meetings are held about every six weeks in the London (Twickenham) area. For more information about joining the club, contact Colin Wright, British DX Club, 54 Birkhall

Road, Catford, London, SE6 1TE, United Kingdom.

Central Indiana Shortwave Club

If you want to get in on the ground floor of an unusual club, the Central Indiana Shortwave Club looks like fun. President Steve Hammer says of this new club: "We are seeking members throughout the Midwest and nationwide who share our interest in off-beat, downright wacky SW broadcasts such as KJES and various pirate broadcasts."

True to the club's billing, its newsletter is called *Shortwave Oddities*. The founding members of CISC met through the Shortwave Echo BBS, and have been meeting informally to trade tales, tapes and tips. Since \$10 gets you a two-year membership and 10 issues of the bulletin, one can assume it will be published five times a year.

To check out this club write to Central Indiana Shortwave Club, c/o Steve Hammer, 2517 E. DePauw Road, Indianapolis, IN 46277-4404.

Other Club News

Congratulations to the Canadian International DX Club on their 31st anniversary. On August 22, they will be staging their 5th Annual CIDX International Radio Festival in Montreal—a celebration of radio featuring broadcasters, displays, amateur radio, door prizes, and more! Contact Sheldon Harvey at 79 Kipps Street, Greenfield Park, Quebec, Canada J4V 3B1 for information.

The South Pacific Association of Radio Clubs is the umbrella organization for most clubs in the South Pacific area. It provides support for these groups in promoting radio listening, and is active in the Handicapped Aid program. Correspondence to SPARC should be addressed to 212 Earn St., Invercargill, New Zealand. Although we do not list these umbrella organizations in our club listings (since most do not accept individual memberships) they can be an important asset to the health of the hobby.

Club Listings M-Z

Metro Radio System: Julian Olansky, P.O. Box 26, Newton Highlands, MA 02161, (617) 969-3000. New England states; Public Safety. *M.R.S. Newsletter*.

Michigan Area Radio Enthusiasts: Bob Walker, P.O. Box 81621, Rochester, MI 48308, Michigan & surrounding; All bands. *Great Lakes Monitor*.

MONIX (Cincinnati/Dayton Area Monitoring Exchange): Mark Meece, 7917 3rd St., West Chester, OH 45069-2212, (513) 777-2909. Cincinnati/Dayton area; Full spectrum SW and scanning.

National Radio Club: Paul Swearingen, Publisher, P.O. Box 5711, Topeka, KS 66605-0711. Worldwide; AM/FM. *DX News* 30 times yearly, sample for a 29 cent stamp.

NYC Radio Fre(ak)Qs: Joe Alverson, 199 Barnard Ave., Staten Island, NY 10307, 718-317-5556. NY boros & LI; VHF/UHF/HF utilities.

North American SW Assoc.: Bob Brown, Executive Dir., 45 Wildflower Lane, Levittown, PA 19057. Worldwide; Shortwave broadcast only. *The Journal*.

North Central Texas SWL Club: Alton Coffey, 1830 Wildwood Drive, Grand Prairie, TX 75050. Central TX area; All bands.

Northeast Ohio SWL/DXers: Donald J. Weber, P.O. Box 652, Westlake, OH 44145-0652. NE Ohio; SWBC and utilities.

Northeast Scanner Club: Les Mattson, P.O. Box 62, Gibbstown, NJ 08027, (609) 423-1603 evenings. Maine thru Virginia; UHF/VHF, public safety, aircraft, military. *Northeast Scanning News (NESN)*.

Ontario DX Association: Harold Sellers, General Mgr., P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada, (416) 853-3169 voice

& fax, (416) 444-3526 DX-Change information svce. Predominantly Province of Ontario; SWBC, utility, MW, FM-TV, scanning, technical, propagation. *DX Ontario*.

Pacific NW/BC DX Club: Phil Bytheway, 9705 Mary NW, Seattle, WA 98117, (206) 356-3927. WA, OR, ID, BC; DXing all bands.

Pakistan SW Listeners Club: Mrs. Fatima Naseem, Sultanpura, Sheikhpura, 39350 Pakistan; Pakistan; SWBC.

Pitt City SW Listeners Club: L. Neal Sumrell, Rt. 1 Box 276, Sumrell Rd., Ayden, NC 28513-9715. Eastern NC; Shortwave bands. *The DX Listeners*.

Puna DX Club: Jerry Witham, P.O. Box 596, Keaau, HI 96749; Puna, HI; SW and MW.

QSL Club de France: Patrick Frigerio, 40 Rue de Hagenau, 67700 Saverne, France. All bands. *Courrier* (in French). 6 bulletins, 42 FF, EEC 12 IRCs, elsewhere 16 IRCs.

Radio Monitors of Maryland: Ron Bruckman, P.O. Box 394, Hampstead, MD 21074. Maryland; VHF/UHF/HF utilities. *Radio Monitors Newsletter of MD*.

RCMA (Radio Communications Monitoring Assn.): Carol Ruth, Gen'l Mgr., P.O. Box 542, Silverado, CA 92676. North America, Europe, Australia; All modes above 30 MHz. *RCMA Journal*.

Regional Communications Network (RCN): Bill Morris, Public Info. Officer, Box 83-M, Carlstadt, NJ 07072-0083. 50 mile radius of NY City; 2-way Radio Public safety notification group.

Rocky Mountain Monitoring Enthusiasts: James Richardson, 11391 Main Range Trail, Littleton, CO 80127, 303-933-2195. Regional Rocky Mtn area; scanner monitoring.

Rocky Mountain Radio Listeners: Wayne Heinen, 4131 S. Andes Way, Aurora, CO 80013-3831. Colo-

rado Front Range; All bands. Annual meeting calendar for an SASE.

Southern California Area DXers (S.C.A.D.S.): Don R. Schmidt, 3809 Rose Ave., Long Beach, CA 90807-4334, (310) 424-4634. California area; AM, FM, TV, scanner and shortwave broadcasting.

Southern Cross DX Club Inc.: G.P.O. Box 1487, Adelaide, SA 5001, Australia. Australia, New Zealand, South Pacific; All bands. *DX Post*.

SPEEDX (Society to Preserve the Engrossing Enjoyment of DXing): Bob Thunberg, Business Mgr., P.O. Box 196, DuBois, PA 15801-0196. Worldwide; SWBC, utilities. *SPEEDX* monthly newsletter.

Susquehanna Cty Scanner Club: Alan D. Grick, P.O. Box 23, Prospect St., Montrose, PA 18801. PA area; Scanning all bands.

Toledo Area Radio Enthusiasts: Ernie Dellinger, N8PFA, 6629 Sue Lane, Maumee, OH 43537. NW Ohio and SE Michigan; Shortwave, scanning, amateur.

Triangle Area Scanner/SWL Listening Group: Curt Phillips, KD4YU, P.O. Box 28587, Raleigh, NC 27611. Central NC.

Wasatch Scanner Club: Jon Van Allen, 2872 West 7140 South, West Jordan, UT 84084. State of Utah. VHF/UHF. Newsletter/directory.

World DX Club: Arthur Ward, 17 Motspur Drive, Northampton, England NN2 6LY (in USA-Richard D'Angelo, 2216 Burkey Drive, Wyomissing, PA 19610). United Kingdom and worldwide. SW, MW broadcasting DX, FM & TV DX, amateur radio. *Contact*.

Worldwide TV/FM DXers Association (WTFDA): P.O. Box 514, Buffalo, NY 14205-0514. Worldwide membership; TV, FM, NWS.

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Aug 6-8	Austin, TX	So Texas Section Convention/Joe Makeever, W5EBJ, 8609 Tallwood Dr., Austin, TX 78759.
Aug 8	Peotone, IL	Hamfesters Radio Club, Inc./Robert Truhlar, W9LNQ 1701 W. 101 St., Chicago, IL 60643.
Aug 8	Frankfort, KY	Central Kentucky ARRL Hamfest/Bluegrass ARS Bill DeVore, N4DIT, 112 Brigadoon Pkwy, Lexington, KY 40517, 606-257-3343, 606-273-8345.
Aug 8	Warrington, PA	Location: Western Hills HS, Exit 53 off I-64., \$6 admission. Mid Atlantic ARC Hamfest '93/Al Maslin, W3DZI, (215)446-4936. Bucks County Drive-In Theatre on US 611. \$4 admission, opens at 8 am. Talk in on 147.66/147.06 and 146.52.
Aug 8	White Plains, NY	ARRL Eastern NY Convention/Westchester Emerg Comm Assoc. Westchester County Center.
Aug 13-15	Huntsville, AL	ARRL National Convention/Don Tunstill, WB4HOK 1215 Dale Dr., SE, Huntsville, AL 35801.
Aug 20-22	Socorro, NM	National Radio Astronomy Observatory Special Event Station NA5N for the dedication of NRAO's Very Long Baseline Array. Operating on 80,40,20,15 or 10 meters depending on propagation in the lower portions of the General phone and CW segments. For QSL, send QSL and SASE to NRAO Amateur Radio Club, P.O. Box O, Socorro, NM 87801.
Aug 21-22	Albuquerque, NM	Duke City Hamfest/P.O. Box 6552, Albuquerque, NM 87197 Location: New Mexico Army National Guard Armory, 600 Wyoming Blvd., NE. Talk-in on 147.10 MHz.
Aug 21-22	Vancouver, WA	Clark County ARC Special Event Station Celebrating the 34th annual fly-in at Evergreen flying field. Operation in lower portion of General phone bands; 40,20,15, with possible operation in the 10 meter Novice band, and 75 meter band at night. For a certificate, send an SASE to: CCARC, P.O. Box 1424, Vancouver, WA 98668. For SWLs, a QSL card or report will do.
Aug 22	St. Charles, MO	St. Charles ARC/Eric Koch, NFQ 2805 Westminster, St., Charles, MO 63301.
Aug 28	Manville, NJ	Somerset County ARS Hamfest/Ron, N2RPK, 908-685-1191, 6-9 pm, P.O. Box 2, Franklin Park, NJ 08823.
Sept 4	Troy, OH	Location: Manville Civil Defense Bldg, 60 S. Weiss St., 8 am to 2 pm, \$4 admission, free parking. Talk-in on 448.175, 224.88, 146.52 simplex. Miami County ARC/Gary Kercher, KB8XLN 1263 Gettsburg Dr., Troy, OH 45373.
Sept 17-19	Ventura, CA	ARRL SW Division Convention/Marc Holzer, N6UNX 712 Primrose St., Thousand Oaks, CA 91360.
Sept 19	Mt. Clemens, MI	L'Anse Creuse ARC Swap and Shop/Ted MacKinnon, NW8W 19534 Warwick, Beverly Hills, MI 48025-3970, (313)647-1628. Location: L'Anse Creuse High School, \$3 admission.

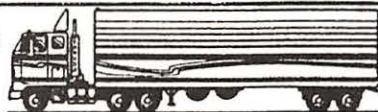
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LETTERS cont'd

that are sent to us. Look for them in the Stock Exchange as space permits.

"In response to the item in the June MT about ball scores (Ask Bob, p 106), be aware that HCJB gives a roundup of sports scores every weekday morning, just after the news headlines around 12:03 UTC Monday through Friday on the *Morning in the Mountains* program.

"Unfortunately, Reuters does not supply us with college scores, but we do highlight baseball, football, hockey, basketball and Latin American soccer. In fact, your readers might join us every morning for good inspirational music, a world newscast at 1203, 1225, 1325 and 1425, *World Weather Watch* at 1245, plus the sports roundup at about 1207 UTC. John Adams is host, and I do the news (except that Leonard Kinzel will be filling in for me until January while I am on furlough).

"And, while we are talking about sports, you might want to know about *Sports Spectrum*, heard each Sunday at 0400 UTC and hosted by Chuck Swirsky, sports director at WGN radio, Chicago. This weekly program features interviews with well-known athletes and coaches who talk about sports and share their faith in Jesus Christ."

Ken MacHarg, Quito, Ecuador

"I am currently experiencing difficulty with mail delivery via the address listed in "Listening to the Lakers," May MT. If any readers have sent mail to me in response to the article and did not receive a reply or their letter was returned, they may write to me at P.O. Box 20644, Ferndale, MI 48220. They are not being ignored."

Russ Hill, "Lakers" author

Jim Allen enjoyed "Listening to the Lakers": "I used to live in Superior, Wisconsin, and worked on the newspaper in Duluth. It was mostly HF back then and I listened with my Heathkit Mohican and an RBC which I picked up in a surplus store. There was a transmitter on the eastern edge of Duluth and it had a clear shot at the lake horizon. I talked to the operator frequently on the landline, as the paper ran a column on the comings and goings of the ships.

"I had some interesting experiences on that job. I got aboard the first Soviet vessel to ever transverse the Great Lakes system, and I was working in the newsroom the night the *Edmund Fitzgerald* went down. The official inquiry concluded that the ship took water through improperly closed hatches, but people who had sailed on the ship were of the opinion that it broke up before it went down because of faulty construction. It even had a nickname: 'Old Shakey.'"

Jim Allen, Columbia, SC

In Commemoration

It is sad to note the passing of a generation of pioneers who made such ground-breaking contributions to life as we know it today. In "Communications," we reported the passing of Don Kresge, who was instrumental in the development of FM and the LORAN navigational system. Vernon Weihe of Arlington, Virginia, also worked on aviation navigational systems, including instrument landing systems and the radar transponder; he died in June at age 84.

Another pioneer who will be remembered by many is Bernard Kardon, co-founder of hi-fi maker Harman-Kardon. Kardon died in April at 79. John Kemeny, the inventor of BASIC computer language, died last December at age 66. The BASIC programming language was never copyrighted and was a big factor in the grassroots computer revolution. More recently, Jim Rafferty, N6RJ, Vice President of Ham Radio Outlet, Inc., died after a long bout with cancer.

We gratefully acknowledge these and the countless others whose imagination, experimentation and hard work have given us radio communications and all our good monitoring times.

*Rachel Baughn,
Editor*

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Scanner Owners Under Assault Again

The right of a scanner owner to monitor the airwaves is under attack on two new fronts: in New Jersey and in Chicago.

As if New Jersey's aborted attempt to outlaw police scanners weren't enough, now a New Jersey investigator has pontificated that certain scanners are primarily useful for the reception of cellular telephone calls. Remarkably, Radio Shack capitulated without dissent, voluntarily removing all scanners with 800 MHz coverage from the entire state, even though *none* of its scanners has cellular telephone capability without modification!

Is this incredible lapse of courage another sign of Tandy's chaotic reorganization as it divests itself of one venture after another? Is Tandy courting favor among New Jersey state legislators in this bastion of cellular telephone industrialists? Or are they merely trying to avoid costly public confrontations as they see profits dwindle in a soft consumer economy?



Whatever the reason for Radio Shack's disappointing flight, it is certain that no scanner is any more "primarily useful" for cellular telephone eavesdropping than a pocket knife is for prying open locked doors — or a cellular telephone is for making illegal drug deals.

Meanwhile, in Chicago, aldermen have proposed a ban on all scanners capable of receiving public

safety frequencies — in other words, all scanners. They point out that scanners can allow criminals to avert arrest.

What the aldermen did not point out, but eloquent representatives of CARMA (Chicago Area Radio Monitoring Association) did, is that sufficient encryption is already in place to guarantee privacy in radio communications.

CARMA also indicated that scanners are useful tools to assist law enforcement, that radio amateurs and other auxiliary public assistance teams utilize scanners to coordinate their lifesaving activities during disasters, that news media rely on scanners to alert them to stories of public importance, and so on.

Whether reason will prevail is unknown at this writing — the vote was to take place July 13, two days after our issue deadline.

Whatever the outcome of the New Jersey or Chicago hearings, make no mistake about it, your right to monitor the airwaves is under siege. Be vigilant with your own legislators and alert us as soon as you hear repressive measures being formulated. We'll sound the alarm and mobilize!

Bob Grove
Publisher

Ed. Note: Chicago bill was defeated; details next month.



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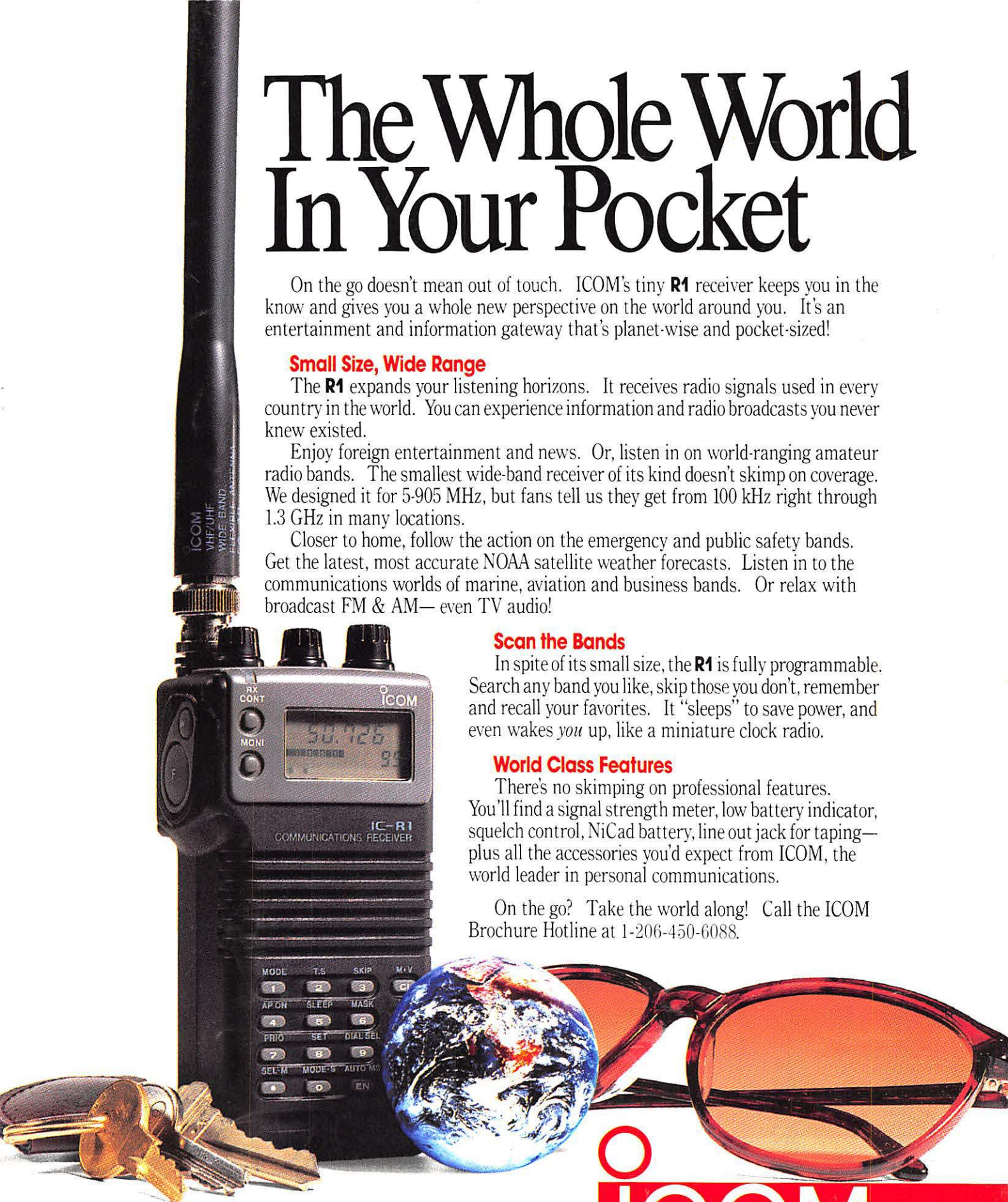
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